VOLUME XXII NUMBER ELEVEN

THE NATIONAL GEOGRAPHIC MAGAZINE

NOVEMBER, 1911

CONTENTS

Glimpses of Japan — WILLIAM W. CHAPIN
With 24 Pages of Photographs in Color

The Kingdom of Flowers—China — ERNEST H. WILSON
With 24 Illustrations

Tripoli: A Land of Little Promise — ADOLF L. VISCHER
With Illustrations and Map

The Great Rainbow Natural Bridge — JOSEPH E. POGUE
With Illustrations

The Mysteries of the Desert

National Geographic Society Notes

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
HUBBARD MEMORIAL HALL
WASHINGTON, D.C.

$2.50 A YEAR 25 CTS A COPY

NATIONAL GEOGRAPHIC SOCIETY

HUBBARD MEMORIAL HALL

SIXTEENTH AND M STREETS, WASHINGTON, D. C.

HENRY GANNETT . . . PRESIDENT
O. H. TITTMANN . . VICE-PRESIDENT
O. P. AUSTIN . . . SECRETARY
JOHN JOY EDSON . . . TREASURER
GILBERT H. GROSVENOR, DIRECTOR AND EDITOR
F. B. EICHELBERGER . ASST. TREASURER
JOHN OLIVER LA GORCE, ASSISTANT EDITOR

BOARD OF MANAGERS

1909-1911

O. P. AUSTIN
Chief U. S. Bureau of Statistics

CHARLES J. BELL
President American Security and Trust Co.

T. C. CHAMBERLIN
Professor of Geology, University of Chicago

GEORGE DAVIDSON
Professor of Geography, University of California

JOHN JOY EDSON
President Washington Loan & Trust Co.

DAVID FAIRCHILD
In Charge of Agricultural Explorations, Dept. of Agric.

C. HART MERRIAM
Chief U. S. Biological Survey

GEORGE SHIRAS, 3D

1910-1912

HENRY F. BLOUNT
Vice-President Am. Security and Trust Co.

C. M. CHESTER
Rear Admiral U. S. N., Formerly Supt. U. S. Naval Observatory

FREDERICK V. COVILLE
Botanist, U. S. Department of Agriculture

JOHN E. PILLSBURY
Rear Admiral U. S. N., Formerly Chief Bureau of Navigation

RUDOLPH KAUFFMANN
Managing Editor, The Evening Star

FRANKLIN K. LANE
Member of the Interstate Commerce Commission

T. L. MACDONALD, M. D.

S. N. D. NORTH
Formerly Director U. S. Bureau of Census

1911-1913

ALEXANDER GRAHAM BELL
Inventor of the telephone

HENRY GANNETT
Chairman of U. S. Geographic Board

J. HOWARD GORE
Prof. Emeritus Mathematics, The Geo. Washington Univ.

A. W. GREELY
Arctic Explorer, Major Gen'l U. S. Army

GILBERT H. GROSVENOR
Editor of National Geographic Magazine

GEORGE OTIS SMITH
Director of U. S. Geological Survey

O. H. TITTMANN
Superintendent of U. S. Coast and Geodetic Survey

JOHN M. WILSON
Brigadier General U. S. Army, Formerly Chief of Engineers

To carry out the purpose for which it was founded twenty-two years ago, namely, "the increase and diffusion of geographic knowledge," the National Geographic Society publishes this Magazine. All receipts from the publication are invested in the Magazine itself or expended directly to promote geographic knowledge and the study of geography. Articles or photographs from members of the Society, or other friends, are desired. Contributions should be accompanied by an addressed return envelope and postage, and be addressed:

GILBERT H. GROSVENOR, EDITOR

ASSOCIATE EDITORS

A. W. GREELY
C. HART MERRIAM
O. H. TITTMANN
ROBERT HOLLISTER CHAPMAN
WALTER T. SWINGLE
ALEXANDER GRAHAM BELL
DAVID FAIRCHILD
HUGH M. SMITH
N. H. DARTON
FRANK M. CHAPMAN

Entered at the Post-Office at Washington, D. C., as Second-Class Mail Matter

Copyright, 1911, by National Geographic Society, Washington, D. C. All rights reserved

1911
CHRISTMAS

THE NEW ELEVENTH EDITION OF THE ENCYCLOPÆDIA BRITANNICA

29 VOLUMES — 40,000 ARTICLES — 44,000,000 WORDS

OVER 32,000 sets (value over $5,000,000) of the New 11th Edition of this celebrated work were sold by The Cambridge University Press, of England, before publication, and were printed, bound and delivered to subscribers within nine months.

Prompt Delivery of the entire work is now assured to those who apply at once. The entire set of 29 volumes will be shipped (f. o. b. New York) shortly after receipt of a first payment of $5.00, or for cash in full.

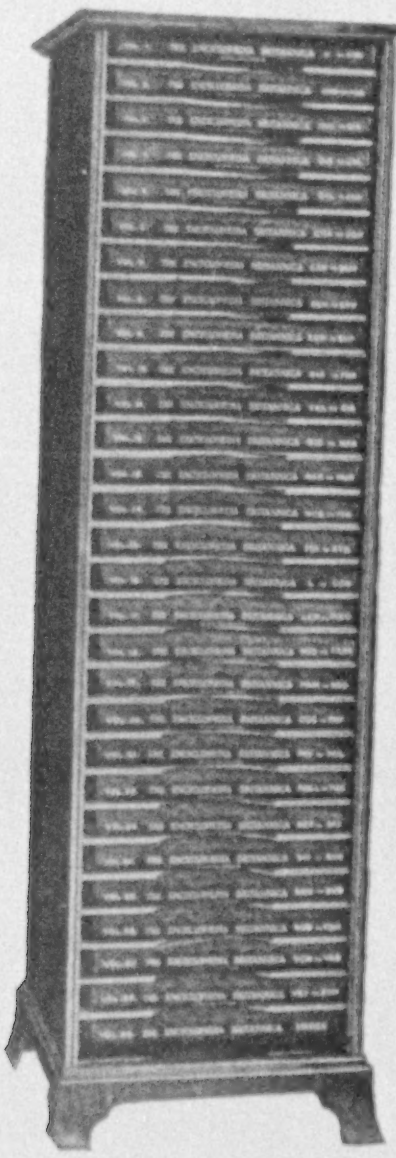
A New Binding (Prayer-book style). The publishers are glad to announce that, after many experiments, they have succeeded in producing a special binding for the India paper edition, which, they believe, will be found to be not only original and beautiful, but specially adapted to the India paper volumes, and very desirable for Christmas gifts. (Ready Nov. 20.)

The new format, as well as the new case for holding the same, are shown by illustrations on this and the next page. The covers are of the finest imported leather, with a specially finished surface like a suede glove, leather lined, silk sewn, round corners, full gilt edges. It is believed that, while the volume can be doubled up so as to be carried in the hand without injury to the book (see photograph), yet the strength of the binding is in no wise impaired. The publishers are confident that no such binding has ever been produced before for a work of this nature.

AN IDEAL CHRISTMAS GIFT

THE supreme merit of the Encyclopædia Britannica, 11th Edition, as a gift is that it effectively imposes high standards. The recipient feels, especially if in the formative period, that the gift of a work of such learning and authority is a subtle tribute to his intelligence, and he feels that, in accepting it, he incurs an obligation to familiarise himself with its contents.

The number of directions in which the systematic use—and this comes naturally—of the Encyclopædia Britannica may influence for good a developing mind, is legion. For idle and listless reading, it substitutes an accurate scrutiny of the foundations of conclusions, opinions and beliefs. By its insistence on what is essential in every question, and by its elimination of all that is irrelevant, it promotes habits of concentration and analysis, and instils a sense of intellectual values. In its thousands of biographies of the men and women who have figured prominently in the human story it opens new horizons and sets up new ideals. To some readers, it may even indicate, for the first time, their real vocation, for it is a fact that, in nearly every efficient useful life, there is traceable, at some parting of the ways, the determining influence of a book.



The 29 volumes of the new Encyclopædia Britannica in Full Limp Leather (Prayer-book style) in the special book-case (mahogany) used only for this binding. The volumes in this beautiful format have perfect flexibility (see photograph overleaf) and each rests on its own shelf. Width of case, 16 inches. Height, 4 feet.

CAMBRIDGE UNIVERSITY PRESS (Encyclopaedia Britannica Dept.)

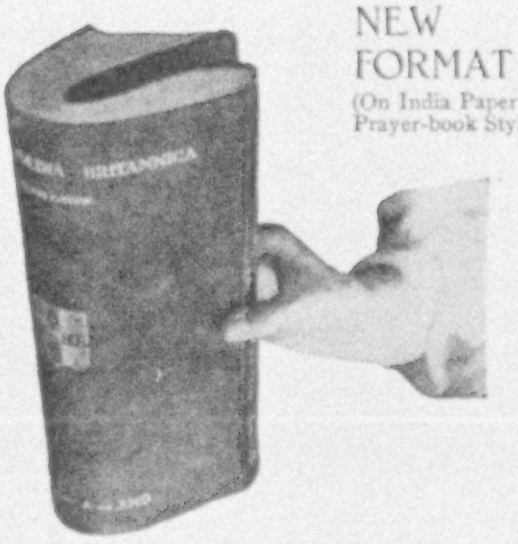
35 WEST 32D ST., NEW YORK — ROYAL BANK BUILDING, TORONTO

(See next three pages)

OLD FORMAT

A volume printed as heretofore on ordinary book paper measures 2¾ inches in thickness and weighs 8 pounds

NEW FORMAT
(On India Paper Prayer-book Style)



Printed on India paper, the same volume is but 1 inch thick, and in the Full Limp Leather binding may be rolled up and held in one hand

"THE MONARCH OF ENCYCLOPAEDIAS"

(Hon. Whitelaw Reid, American Ambassador to Great Britain)

THE New Encyclopædia Britannica, 11th Edition, is a vast repository of human thought, learning and experience brought down to the summer of 1910. In virtue of its comprehensiveness and unfailing devotion to the exposition of knowledge, it combines three features of the widest usefulness to the present generation:

1—It is a register and detailed summary of the world's life and progress.

2—It is a complete inventory of extant knowledge reduced to an A, B, C simplicity of arrangement.

3—It is an index to all recondite, not less than to all common things in which an intelligent person is likely to be interested.

There are 28 volumes of text, aggregating 28,150 pages, which average 1,600 words to the page. Volume 29 consists of an Index containing 500,000 references, and a complete Table of Contents giving every article-heading in the work under its proper classification. By the aid of this Index, which was carefully prepared at an expense of £15,000 ($75,000), it is believed that the reader will be able to find, in the body of the text, the answer to any conceivable question within the limits of reasonable inquiry.

The 1,500 contributors include: 1. **Men of Learning** (scientists, philosophers, divines, university professors, historians, economists). 2. **Men of Action** (soldiers, sailors, men of affairs, jurists, administrators, surgeons, architects, artists, inventors, archæologists, explorers, engineers, sportsmen, manufacturers, financiers). 3. **Practical experts**, men of special knowledge who are professionally engaged in the advancement of industrial undertakings for the welfare of mankind.

The sum of £230,000 ($1,150,000) was paid to contributors and editors, as well as for maps, illustrations, typesetting, plates, etc., before a single copy was offered for sale. *A large prospectus (India paper) post-free.*

THE Encyclopaedia Britannica, the only work which has summarised and elucidated universal knowledge in successive editions during 140 years in a manner commensurate with the expansion and international primacy of the two branches of the English speaking race, had come, by virtue of its acknowledged excellence, to be recognized as an institution, as one of the most prized heritages of American and English scholars and readers. The sale of the previous edition had been even greater in the United States than in "the mother country."

THREE NOTABLE NEW FEATURES

The issue of the new edition (the eleventh since 1768-71), while it was a notable literary event in itself, was signalised by three unprecedented features:

1. **The new edition bore the imprimatur** of the University of Cambridge instead of being issued by a private firm of publishers as hitherto. This added endorsement of the authority of the 1,500 eminent specialists representing all civilised countries, who contributed to the book, served to confirm its status with a swiftness and a certainty not possible otherwise.

2. **The work appeared in a revolutionary format** which rendered the Encyclopædia Britannica for the first time a convenient book to hold and, therefore, agreeable to read. Printed on India paper (tough, light and thin, but, at the same time, opaque), the volumes measure **but one inch in thickness** instead of two and three-quarter inches as heretofore, though containing **identically the same matter and produced from identically the same plates as the familiar impression on ordinary paper.**

3. **The third new feature was the low price.** The last completely new edition (the Ninth, 1875-1889) had been sold at $7.50 a volume, cloth bound, and at $10.00 a volume in Half Russia. The 11th Edition, on the other hand, is sold at prices averaging, in the several bindings, about 40 per cent less.

A REMARKABLY SUCCESSFUL INNOVATION—THE INDIA PAPER EDITION OF THE NEW ENCYCLOPAEDIA BRITANNICA

THE remarkable improvement in the physical get-up of the volumes at once opened up limitless possibilities for the reader. Reading an encyclopædia for the sake of reading became an enjoyable and fascinating experience hitherto denied to all users of this work. Yet no other book, as a matter of fact, offers so much that is calculated to arrest the attention and benefit the mind as does this one, which drafts its contributors from the whole world of scholarship, *belles lettres* and achievement, and which includes in its 44,000,000 words of text "everything that can possibly interest or concern a civilised people."

Interior View Showing the India Paper Edition in use in an English Country House

NOW A BOOK TO READ MERELY FOR PLEASURE

It is open to question which of these new features—the sponsorship of the great English University, the use of India paper for a work traditionally regarded as a series of bulky and unattractive volumes, or the low price—contributed most to the extraordinary success of the first distribution. "Nothing succeeds like success," and so the novelty of the idea of the Encyclopædia Britannica actually falling at last into the category of books that one likes to have close at hand—for arm-chair or fire-side reading, or handy enough "to tuck in a grip," as a New England college professor expressed it—quickly appealed to a wide circle of American and English book buyers, and ultimately forced the publishers to resort to the expedient of accepting thousands of orders subject to delay in manufacture.

The manufacture of the 11th Edition exceeded all records in the printing and binding of books. 32,000 sets, 928,000 volumes, were printed, bound and delivered between January 20th and October 25th. Of these, 90 per cent were printed on India paper, and but 10 per cent on ordinary book paper, the almost unanimous preference of the public for the convenient new India paper form testifying to the fact that a new standard in the technical production of books had been reached.

It was necessary to purchase abroad 2,000 tons of India paper, none being made in this country. 580,000 covers for the India paper volumes, bound in Full Flexible Sheepskin and Full Flexible Morocco, were also imported.

PROMPT DELIVERY ASSURED

The Cambridge University Press is now able to announce that all arrears in delivery have been caught up, the publishers having for some months devoted themselves wholly to the task of manufacturing, of dealing with the largest aggregate of sales in the history of publishing. They are daily in receipt of evidence (in the form of appreciative and enthusiastic letters from subscribers in every walk of life) of the extended reputation of the work for every purpose of reading, reference and research.

In view of this popular endorsement of the book as sustaining the fame of the university whose imprimatur it bears, as also the great tradition, extending over 140 years, of The Encyclopædia of which it constitutes the last edition, the publishers, in reopening the subscription lists, confidently anticipate a demand for the forthcoming issue which will rival that for the first. The printing and binding of so large a work are, necessarily, slow, especially in the case of the India paper edition, and the publishers are far from sanguine that the available supply will suffice to meet the orders due to the approaching Christmas season.

ORDERS FOR CHRISTMAS PRESENTS

Therefore, subscribers who contemplate presenting the 11th Edition of the Encyclopaedia Britannica as a Christmas gift—and, assuredly, no gift could be conceived which would be more prized, more useful, or which, in years of efficient service, would more frequently recall the donor—are advised to make immediate application, for only if they do so can the publishers guarantee delivery on or before December 25th. Particularly is this advice offered in the case of subscribers living in remote parts of the country, in shipping to whom allowance must be made for a considerable interval for transport and for possible delays en route.

XUM

THE NEW ENCYCLOPAEDIA BRITANNICA, 11TH EDITION

A COMPLETE AND MODERN EXPOSITION OF HUMAN THOUGHT, LEARNING AND ACHIEVEMENT UP TO 1910

ISSUED BY THE PRESS OF THE UNIVERSITY OF CAMBRIDGE (England)

THE work, in 28 volumes and index, is in two forms:

(1) On **India Paper** (very light and opaque) in four styles of binding: **Cloth, Full Flexible Sheepskin, Full Limp Leather** (Prayer book style), and **Full Flexible Morocco**, the volumes being one inch thick (about 1,000 pages).

The India paper impression bound in either Full Sheep, Full Limp Leather or Full Morocco is strongly recommended.

(2) On ordinary book paper in three styles of binding: **Cloth, Half Morocco, and Full Morocco**, the volumes being 2¾ inches thick (about 1,000 pages).

CHEAPNESS OF THE 11TH EDITION AT THE PRESENT PRICES

In assuming control of the Encyclopædia Britannica the Syndics of The Cambridge University Press regarded its sale at a low price as an inherent characteristic of the undertaking.

They believe that in respect of cheapness no publication can be compared with the 11th edition of the Encyclopaedia Britannica at the present price.

A single volume of the New 11th Edition contains some 1,000 pages, and over 1,500,000 words, yet is sold at only $4.50 a volume in the cheapest form.

An ordinary book of travel, or of memoirs, a biography, historical or literary, a scientific manual or text book, if it contains as many as 200,000 words, usually costs about $5.00.

A purchaser, therefore, obtains in a single volume of the new Encyclopaedia about eight times as much matter at a less cost than if he were buying ordinary books.

The accepted scale of book prices is, in fact, too different to afford a satisfactory comparison, and the only true criterion in the matter is the price of the 9th edition of the Encyclopaedia Britannica. This was originally sold at 30s. ($7.50) a volume, although each volume contained 100 pages less than do those of the new edition, which may now be purchased (in the same style) at little more than half that price.

To the former figure, however, of 30s. ($7.50) (which may be regarded as the normal, the standard, charge) the price of the new edition will eventually be raised.

APPLICATION FOR THE NEW INDIA PAPER PROSPECTUS

Full particulars of prices, deferred payments, bookcases, bindings (including the new Full Limp Leather, Prayer-book style), together with the prospectus described opposite, will be sent free, on application to

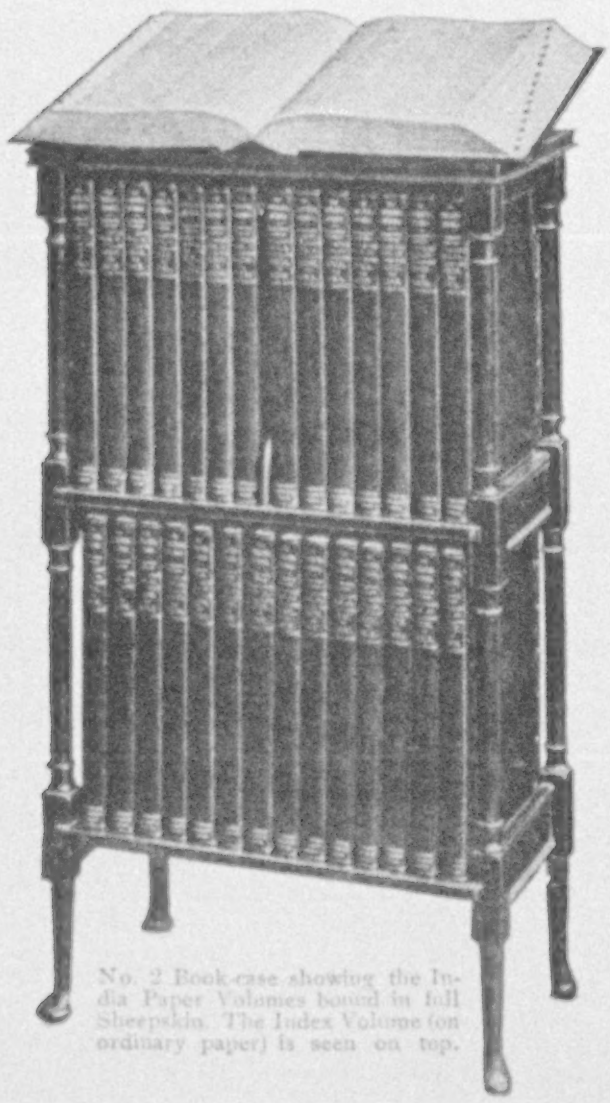
CAMBRIDGE UNIVERSITY PRESS
(Encyclopaedia Britannica Department)
35 WEST 32D STREET, NEW YORK

Please send me the new India Paper Prospectus of the 11th Edition of the Encyclopædia Britannica.

Name_____

Profession or Business_____

Residence_____



No. 2 Book-case showing the India Paper Volumes bound in full Sheepskin. The Index Volume (on ordinary paper) is seen on top.

FIRST PAYMENT, $5.00

The present low price may the more easily be afforded owing to the institution of serial payments. $5.00 is all the immediate outlay that is required to obtain delivery of the 29 volumes, and, after they have been received, purchase may be completed in monthly payments of the same amount. The work is, therefore, placed within the reach of all.

Should the subscriber, however, find that it better suits his convenience to complete purchase in a shorter time, he may do so by making 4, 8 or 12 monthly payments, at practically the cash price.

A 164-PAGE PROSPECTUS SIMILAR IN FORMAT TO THE WORK IT DESCRIBES —POST-FREE UPON APPLICATION

The reduction in weight and bulk effected by the use of India paper has been utilized by the publishers of the new Encyclopædia Britannica in the preparation of a new prospectus in which the book is described with a fidelity and at a length attainable within a reasonable compass in no other way. In format this prospectus is a replica of the India paper impression, and it has thus been possible not only to reproduce a large number of extracts from typical articles exactly as they appear in the original work, but to exemplify in the prospectus itself, which consists of 164 pages of printed matter, together with numerous selected plates, maps, cuts, etc., the convenience and compactness of the India Paper Format.

The Hamilton Time-keeper

This is Engineer C. W. Goodall in the cab of Chicago and Rock Island Locomotive No. 1017, the engine in which he made his record run—181 miles in 146 minutes—with the "Gates Special."

Mr. Goodall carries a Hamilton Timekeeper, as do more than half of the railroad men on American railroads where there is official time inspection.

On one watch inspection division of the Rock Island Railroad, out of a total of 313 watches of 13 different makes in service, nearly half (150) are Hamilton Timekeepers.

The long experience of the Hamilton Watch Company in making close rating, accurate Timekeepers for railroad men has enabled them to produce phenomenally accurate and very beautiful thin model watches for men and women in all walks of life.

Hamilton Timekeepers are made in all standard sizes. Prices complete, beautifully cased and in mahogany boxes, vary, according to size, movement and casing, from $38.50 to $125.

For more information about the exceptional time-keeping qualities of the Hamilton—ask your jeweler or a railroad man, or

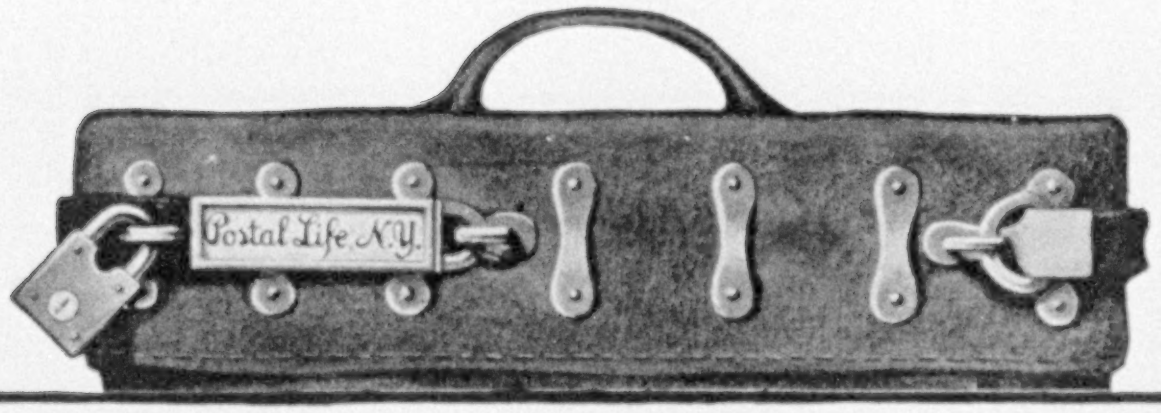
Write for "The Timekeeper"

The Hamilton "12-size" Thin Model

"The Timekeeper" is the name of our book which tells about the Hamilton Timekeeper and illustrates the various sizes, etc. We gladly send it to any one interested in the purchase of a watch.

HAMILTON WATCH COMPANY, 911 Columbia Avenue, Lancaster, Pa.

Makers of The Railroad Timekeepers of America



POSTAL LIFE BUILDING

35 Nassau St. NEW YORK

Strong Postal Points

First: *Old-line, legal-reserve insurance*—not fraternal or assessment.

Second: *Standard policy-reserves*—now more than $10,000,000.

Third: *Standard policy-provisions*, approved by the State Insurance Department.

Fourth: *High medical standards* in the selection of risks.

Fifth: *Standard rates* but reduced by commission dividends, *guaranteed in the policy*, as stated herein.

The Postal Life Insurance Company pays *you* the Commissions that other Companies pay their *agents.*

45% of the first year's premium is the average *Commission Dividend guaranteed* to each POSTAL policyholder on entrance into the Company. Other companies would pay this sum to an *agent*—as *his commission.*

That's for the *first year:* in *subsequent* years POSTAL policyholders also receive the *Renewal Commissions* other companies pay their agents, namely, 7½%; likewise they receive an *Office-Expense Saving* of 2% making up the

Annual Dividend of 9½% Guaranteed in the Policy

And the POSTAL pays the usual contingent dividends *besides*—ranging up to 20% of the annual premium.

Such is the POSTAL way: it is open to *you.* Call at the Company's offices if convenient, or *write now* and find out the exact sum it will pay *you* at *your* age—the *first year* and *every other.*

POSTAL LIFE INSURANCE COMPANY

The Only Non-Agency Company in America

35 Nassau St., New York

See How Easy It Is

In writing simply say: *Mail me insurance-particulars for my age as per NATIONAL GEOGRAPHIC for November.*

In your letter be sure to give:

1. *Your Occupation.*
2. *The Exact date of your Birth.*

No agent will be sent to visit you: the Postal Life employs no agents.

Assets:
$10,839,000

Insurance in force more than
$55,000,000

"Geographic readers may depend upon the integrity of our advertisers."

Some Scribner Holiday Books

Peter and Wendy

By J. M. BARRIE

It is the narrative of the play "Peter Pan," its peculiar fascination heightened by new fantasies and containing much that no play could contain of Barrie's humor and feeling in comment and description. The story carries farther than did the play, too, and ends more satisfactorily.

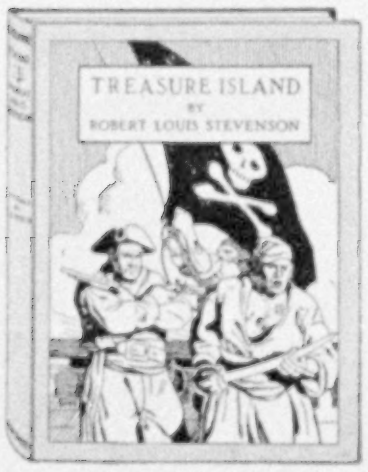
Illustrated by F. D. Bedford. $1.50 net; postage extra.

Memories of Two Wars

By Brigadier-General FREDERICK FUNSTON

In this vigorous narrative of hard fighting in picturesque surroundings, General Funston describes his service in the Cuban insurgent army and in the United States army in the Philippines.

Illustrated. $3.00 net; postpaid, $3.30.



Treasure Island

By ROBERT LOUIS STEVENSON

Mr. Wyeth's bold, vigorous colorful pictures supplement perfectly the classic text that has made "Treasure Island" pre-eminent among stories of its type, to form a holiday book that will enthrall readers of all ages.

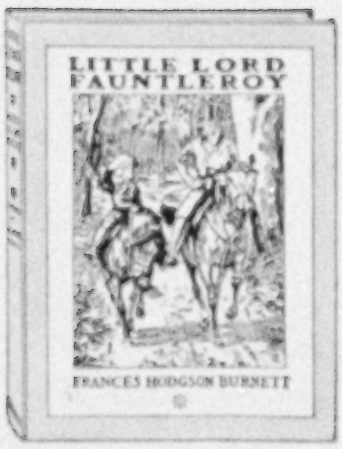
16 full-page illustrations in color by N. C. Wyeth. Large square 4to. $2.50.

Recollections, Grave and Gay

By Mrs. BURTON HARRISON

Intensely interesting recollections of the South before the War, of the War itself, and of New York society after the War. The author, formerly Miss Constance Cary, of the Virginia Carys, and the wife of Burton Harrison, Jefferson Davis's secretary, who became a leading New York lawyer, has these advantages over most authors of War memories—that she brings to her work the skill of a trained and brilliant writer, and that her own position, connections, and the force of circumstance brought her into close touch with leading characters.

$2.50 net; postpaid, $2.70



Little Lord Fauntleroy

By FRANCES HODGSON BURNETT

In these illustrations he has not departed in the least from his original conceptions. Many scenes are new and many old ones are pictured differently, but the original idea of the different characters is only intensified in these beautiful full colored representations.

With a new preface by the author. 12 full-page illustrations in color and 24 pen-and ink sketches by Reginald Birch. 4to. $2.00 net; postage extra.

Send for our Holiday and Juvenile Catalogues.

New Novels

Ethan Frome

By EDITH WHARTON.

So absorbing is the book that you want to read it at a sitting. You can read it that way, with the result that the total impression is as vivid as on going away at the close of the performance of a great play.—*N. Y. Evening Sun.*

$1.00 net; postpaid, $1.10

The Outcry

By HENRY JAMES.

This new novel by Henry James turns on the much-mooted question in England—whether the English inherited of rare and beautiful works of art are bound to hold them, as it were, in trust for the nation; whether they may be held to account for their guardianship by public opinion. It is just such a question as Mr. James knows better than any other writer how to handle. It gives him an opportunity to bring in many subtly drawn characters, both English and American.

$1.25 net; postpaid, $1.35.

The Song of Renny

By MAURICE HEWLETT.

It is a better book even than "The Forest Lovers." . . . In its spontaneity, in its swift elastic movement, in its fragrant atmosphere, **The Song of Renny** might be the work of a young master just arrived to take the town by storm. . . . No one else has ever done such work as he has done in "The Forest Lovers" and now again in **The Song of Renny.**—*N. Y. Tribune.*

$1.50

Kennedy Square

By F. HOPKINSON SMITH.

The best novel he ever wrote. . . . All that was best in the vanished life of the old South has been touched into life and love, into humor and pathos, in this fine and memorable American Novel.—*Record-Herald.*

4th Large Ed. Illustrated. $1.50.

Beautifully Illustrated Books

The Arabian Nights

THEIR BEST KNOWN TALES

Edited by KATE DOUGLAS WIGGIN & NORA ARCHIBALD SMITH.

With 12 full-page illustrations, title-page, cover, and lining paper in full colors by MAXFIELD PARRISH. *Square 8vo, $2.50.*

A Child's Garden of Verses

By R. L. STEVENSON.

With 8 full-page drawings in colors and more than 50 others in black and white by FLORENCE STORER. *8vo, $1.50.*

Peter Pan in Kensington Gardens

By J. M. BARRIE.

A new edition of this classic for children, with 16 of the celebrated illustrations by Arthur Rackham, reproduced in full colors.

With 16 illustrations in color by ARTHUR RACKHAM. *$1.50 net.*

CHARLES SCRIBNER'S SONS 153 FIFTH AVE., NEW YORK

"Mention the Geographic—It identifies you."

The attention of Members of the National Geographic Society who may be planning to give books for Christmas gifts is directed to the three-page announcement of Cassell & Company, Ltd., which appeared in the previous (October) issue of this Magazine.

The special feature to be emphasized is the unusual fact that Members and their families are permitted to inspect the volumes in their homes preliminary to purchase, all carriage charges prepaid.

"SOO" LINE

Summer Days

Plan NOW
to Spend Your Vacation
at one of the

286 Resorts on the SOO LINE 286

in

ILLINOIS—MICHIGAN—WISCONSIN—MINNESOTA—NORTH DAKOTA

Write **W. R. Callaway, G. P. A., Minneapolis, Minn.**, for Booklets

Canadian Rockies
(Open all the Year)
BANFF
LAGGAN
FIELD
GLACIER
KOOTENAY
and
EMERALD LAKE
Send 2 Cents for Booklet, "Notes by the Way"

On a Saturday Afternoon

—RESTS for the WEARY—

Alexandria, Minnesota	Two Cents
Antioch, Illinois	"
Buffalo, Minnesota	"
Burlington, Wisconsin	"
Detroit, Minnesota	"
Fifield, Wisconsin	"
Glenwood, Minnesota	"
Reserve, Wisconsin	"
Waukesha, Wisconsin	"
Waupaca, Wisconsin	"

64-Page Book in Colors on HUNTING and FISHING, 6c.
(Pictured Stories Free)

"SOO" LINE

"Geographic readers may depend upon the integrity of our advertisers."

The Original Edition of the World Famous

OLD TESTAMENT

As Illustrated by
J. JAMES TISSOT

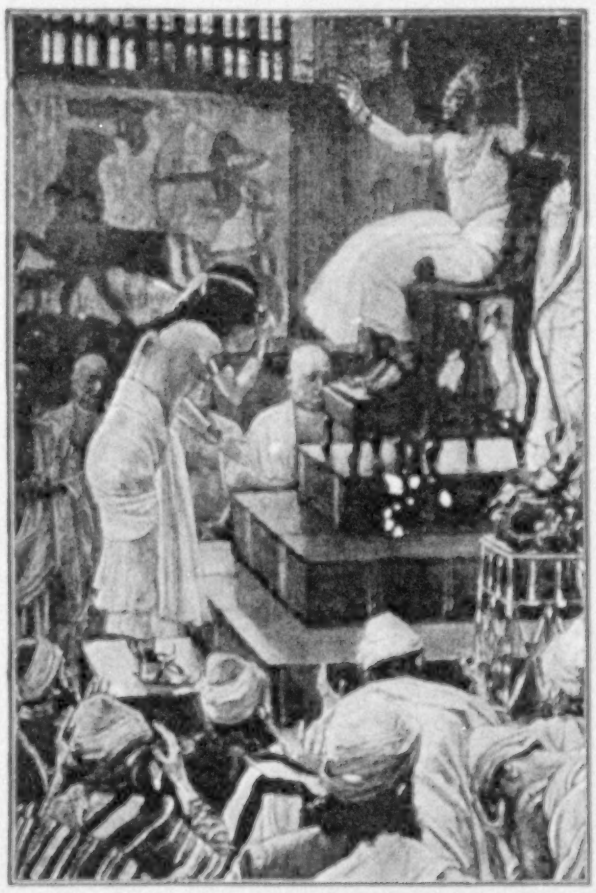
YOU CAN SAVE 75 PER CENT BY PURCHASING TODAY

396 Tissot Pictures
117 in Full Color

This Old Testament comprises two massive, Royal Quarto volumes (11x14 inches) of 350 pages each, sumptuously bound in three quarters leather, with gold tops and decorations. The type is large, clean and new. The paper is exceptionally heavy, with enamelled finish, thus enabling the printer to bring out in all their richness and softness the colors in exact duplicate of the originl paintings.

An Inspiration in Religion
An Education in History
A Revelation in Art

Think of it, just for a moment—sixteen years of a great artist's life spent in making these beautiful paintings. Sixteen years of study and care and travel and work were devoted to making these pictures right—to make them tell us the Old Testament stories—to make the Bible *real* to us. They make us know the real spirit of life in Old Testament times—how they lived, how they looked, what they did, how they did it. They give us a better, truer, understanding of the Bible and its teaching.



J. James Tissot. Copyright by de Brunoff, 1904.

JOSEPH AND HIS BRETHREN.

It would be impossible, if the whole history of art was ransacked and every apt picture selected, to gather a set of paintings that would approach in completeness Tissot's work, for he has brought to it not only the skill and training of a great and famous artist, but the knowledge of a profound biblical scholar and the conviction of a devout and religious temperament.

The original paintings have been purchased by the N. Y. Public Library and have been put on permanent exhibition.

Reduced from $65.00 to $17.00

Sent Express Prepaid

Order today. We cannot guarantee to fill at this price unless order is received at early date. Money refunded if not satisfactory

$3.00 Will Bring These Volumes, Charges Prepaid, to Your Door

A Few Press Comments

New York Sun—"People here will find it beyond comparison the most remarkable book of its kind ever presented."

New York Tribune—"We are awed by the divinity interpreted in these remarkable works of art."

Philadelphia Ledger—"It is the kind of faithfulness that the camera never gets."

Philadelphia Enquirer—"The Tissot pictures are epoch-making pictures."

The Review of Reviews—"M. Tissot has certainly wrought wonders."

The Churchman—"Meissonier himself was forced to admit that he had met his peer in the picturer of Palestine."

Greatest Book Bargain Ever Offered.

These inspiring pictures and these sumptuous volumes must be seen to be appreciated. No description can do them justice. That is why we send them, for your examination, on such terms that *you do not risk one cent.*

Send Now; Only $3

and $2 each month for seven months, and we will send the books AT ONCE, Express Prepaid.

Money refunded if not satisfactory.

COUPON

Tissot Picture Society,
27 E. 22d St., N.Y.

Send by express, prepaid, Tissot's Old Testament, two volumes, bound in ¼ morocco. I inclose $3 for first payment and will send you $2 per month for seven months. Money refunded if not satisfactory.

Name .....

Address .....

City .....

State .....

The Tissot Picture Society

27 East 22d Street, New York City

SCRIBNER'S MAGAZINE

- MCMXII -

THE NEW SERIAL, ***The Turnstile,*** by A. E. W. MASON, author of "The Four Feathers," "The Broken Road," etc., began in the October number.

ROBERT GRANT'S ***Convictions of a Grandfather.***

The changed social, political, and living conditions are dwelt upon, the question of the accumulation and uses of great fortunes, the increased cost of living, divorce, woman suffrage—almost everything of vital and familiar interest.

PRICE COLLIER, whose "England and the English from an American Point of View" was a real literary sensation, will later in the year begin a series of papers along similar lines upon ***Germany and the Germans.***

THE ***Traces and Influence of France in the Settlement of America,*** by PRESIDENT FINLEY.

The romantic and wonderful story of the settlement and growth in civilization and power of the great Middle West, the marvelous changes that have followed in the footsteps of the old French explorers—La Salle, Marquette, Joliet, and others.

SENATOR HENRY CABOT LODGE will be represented by a group of articles giving his ***Reminiscences of Early Days.***

THE ***Witching Hill Stories,*** by E. W. HORNUNG, creator of the incomparable Raffles, past-master of the short story of mystery and adventure.

A most remarkable and fascinating series of experiences in a London suburb.

THE ***Men Behind the Bars.*** MISS WINIFRED TAYLOR, who for many years has devoted her life to the study of prisons and prisoners,

will contribute three articles of intense human interest on the prisoners in penal institutions, dealing with their lives, characteristics, prospects of their reform, etc.

Have You Seen the

Beautiful Christmas Scribner?

SPECIAL OFFER: For the next three months the PUBLISHERS of SCRIBNER'S MAGAZINE offer extraordinary inducements to any one who secures a specified number of subscriptions to the Magazine. Agents wanted in every town. Write now for Booklet A, giving full particulars. Address SCRIBNER'S MAGAZINE, New York City.

"Geographic readers may depend upon the integrity of our advertisers."

Tour the World with Burton Holmes

"IF you have imagination; if the world invites you; if you are not content to have seen only the four walls of your home, then you must travel."

IF time is an obstacle—
IF money is an obstacle—
IF family ties is an obstacle—
IF health is an obstacle;

Get The

BURTON HOLMES TRAVELOGUES

30,000 Miles of Travel

Through 40 Cities and Countries

Cost $250,000 and 20 Years' Work

4,000 Pages of Descriptive Text

5,000 Half-tone Illustrations

36 Full-Page Color Plates

(and you can secure all of them for a few cents a day)

In these 12 Volumes you have the opportunity to gain that broader view of things a knowledge of the world gives you.

Burton Holmes unfolds before your eyes the beauty of travel in foreign lands, with such narrative skill, with so many strange experiences, incidents and humorous episodes and so admirably illustrated by over 5,000 photographs taken on the spot by Mr. Holmes himself as to carry you in spirit over 30,000 miles of travel through forty of the most interesting countries and cities of the world.

It would cost you $50,000 and many years of your time to take these journeys.

A few cents a day buys the Travelogues.

Write us today and we will send you a beautiful picture of the Brandenburg Gate—Berlin (in colors), suitable for framing, also a handsomely illustrated Brochure, containing half-tone views of the famous Champs Elysees in Paris—Portraits of Rulers, and picturesque types of the people of foreign lands, together with a full description, and tell you how you may secure the TRAVELOGUES for a few cents a day.

MAIL THIS COUPON FOR FREE BOOKLET

McClure's Tourists' Agency
381 Fourth Avenue, New York

TEAR OFF, SIGN AND MAIL TODAY

Nov.
N.G.M

McClure's Tourists' Agency
381 Fourth Avenue,
New York City

Gentlemen:

Please send (without expense to me) booklet containing Color Plate, (Brandenburg Gate, Berlin) specimen pages with half-tone etchings and full description of the BURTON HOLMES TRAVELOGUES.

Name.....

Address.....

The Doctrine of Conservative Investment

There is no greater incentive towards thrift and economy than that induced by conservative investment. It is a mistake to imagine, however, that conservative investment is to be determined by surface conditions alone. Margin of safety, stability of earnings, marketability, interest rates, and other important factors all have a bearing upon safe and profitable investment.

This should make it obvious that investors acting on the advice of an individual having little or no knowledge of the fundamental principles of investment are more than likely to be misguided. In fact, it is extremely doubtful if any one failing to fortify his personal opinion by the knowledge and experience of an efficient investment organization is qualified to act in an advisory capacity in the matter of conservative investment.

Therefore, prudent investors the country over are coming more and more to seek out for *themselves* reliable and experienced investment banking firms, whose function it is to aid them in selecting investments that would seem to be best adapted to their particular requirements, and whose knowledge of the various factors affecting conservative investment is the result of special study and careful investigation.

Once the average person becomes familiar with the facilities thus afforded, conservative investment ceases to be a difficult problem.

We shall be glad to suggest to you sound investment bonds, which, in our judgment, have behind them good security and stability of earnings. The bonds yield an income return of approximately **5 per cent,** and have every reasonable promise of appreciation in value.

Write for Bond Circular No. 436,

"Investment Securities."

Spencer Trask & Co.

Investment Bankers

Albany, N. Y., State and James Streets
Boston, Mass., 50 Congress Street
Chicago, Ill., 72 West Adams Street

43 Exchange Place, New York
Members New York Stock Exchange

VOL. XXII, No. 11 WASHINGTON NOVEMBER, 1911

THE NATIONAL GEOGRAPHIC MAGAZINE

GLIMPSES OF JAPAN

By William W. Chapin

Author of "Glimpses of Korea and China," with 39 Photographs in Colors, in the National Geographic Magazine for November, 1910

WHEN we recall the scenes of our delightful days in Japan, our minds are filled with the wonderful harmony of it all. The people, their dress, the flowers, the temples, the homes and gardens—in fact, everything seemed to fit in place like the instruments of a great orchestra.

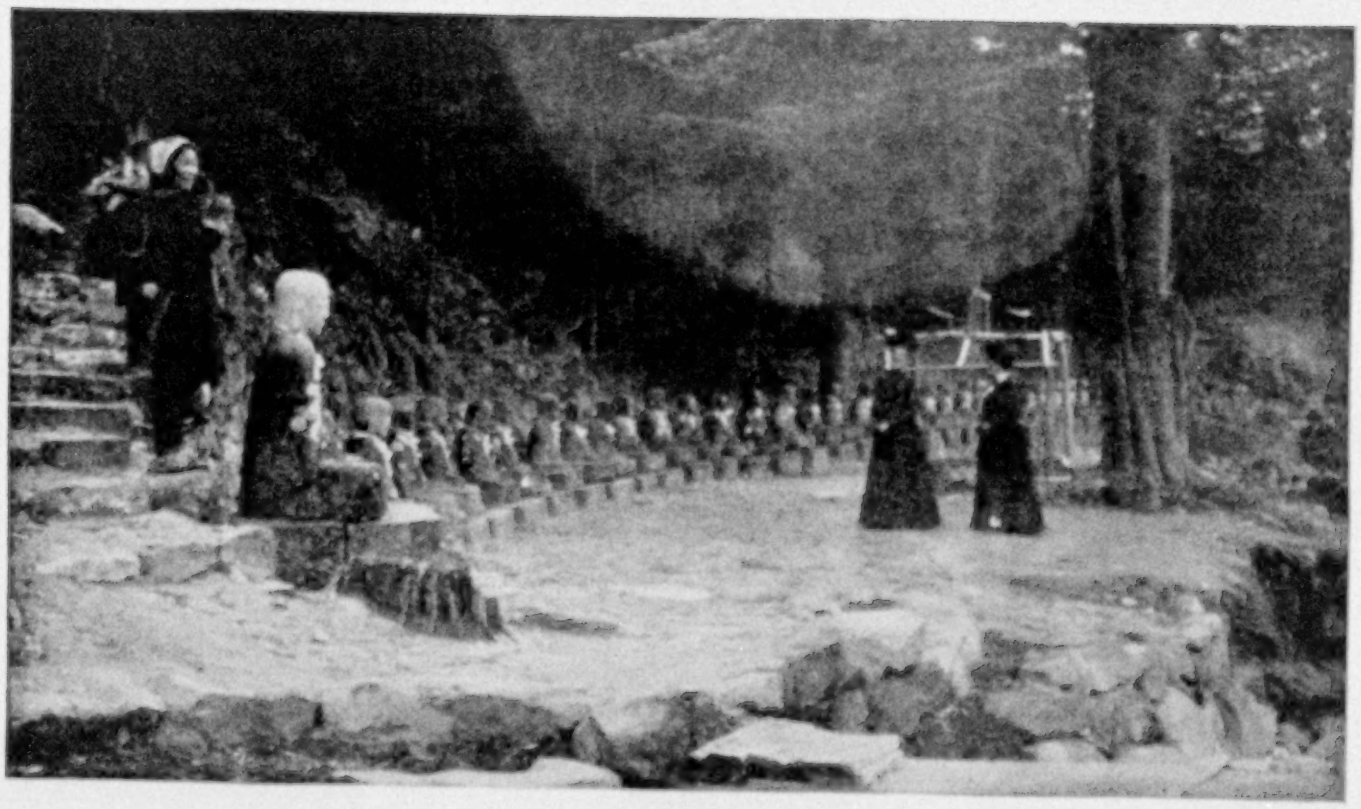
The months of our sojourn resembled a delightful picnic, so much of our time was spent in the open, carried in the comfortable "rikishas," or the more dignified "kagos" (native basket chairs), accompanied by the ingenious native lunch-baskets. The Japanese are remarkable for their out-of-door life. Probably no people have more fête days or enter more heartily into the observance of them.

In these festivals the flowers are the most important feature. It matters little what kind is in season—the flowering plum, cherry, wisteria, azalia, peony, iris, lotus, chrysanthemum, or maple—where the flowers are, there are the people, and the evidence of their enjoyment is unmistakable.

The Emperor's cherry blossom and chrysanthemum garden parties are annual affairs, as well as that of Count Okuma, Japan's grand old man. One of the Count's hobbies is propagating and collecting dwarf maples and chrysanthemums. His collection of the former numbers 500 and of the latter 900. This national prominence given to flowers is a powerful incentive to floriculturists to attain the best possible results.

A visit to the Maple Club, in the suburbs of Tokio, was one of our pleasant experiences. Here dinners are served in the highest style of the Japanese art, and if one discovers native cooking is not to his liking, he can forget his hunger for the time being in watching the "merry whirl" of the dancing girls (see page 985), accompanied by the more sedate and less attractive geishas, whose music is as devoid of tune or harmony as the so-called dance is of dancing, according to Western ideas.

The grounds connected with the clubhouse are very attractive and formed an appropriate setting for the pretty little women, who were induced to pose before the kodak by a promise of a picture for each. Later, on delivering the prints, we were informed that we had broken the record, for this was the only time they had received the reward which many, many times had been promised.



Photos by W. W. Chapin

SEVEN STONE BUDDHAS: NIKKO

THE SEVENTY-EIGHT BUDDHAS (SEE PAGE 972)

Our excursion from Tokio to view the cherry blossoms proved a double joy, as, in addition to the wonderful display of the exquisite, fluffy bloom, resembling most delicately tinted clouds, we were afforded an unusual opportunity of studying the people in their free and easy enjoyment of the occasion (see pages 976-978).

Near the Sumida River, about seven miles from Tokio, is the Arakawa Ridge, a road raised about eight feet above the surrounding paddy fields, and bordered on either side for many miles with the double-flowering variety of cherry trees. Here, as long as the display lasts, the people gather day after day, wandering up and down, abandoned to the enjoyment of the scene. They are dressed in holiday attire, the colors of their kimonos and obis vying with those of the blossoms; so it was a toss-up which produced the most brilliant display. Numerous booths, elaborately decorated with lanterns and paper ornaments, for the sale of sake, tea, and refreshments, together with roving bands of musicians and dancers, some of them in grotesque costumes, added greatly to the entertainment of the crowd as well as ourselves.

Photo by W. W. Chapin

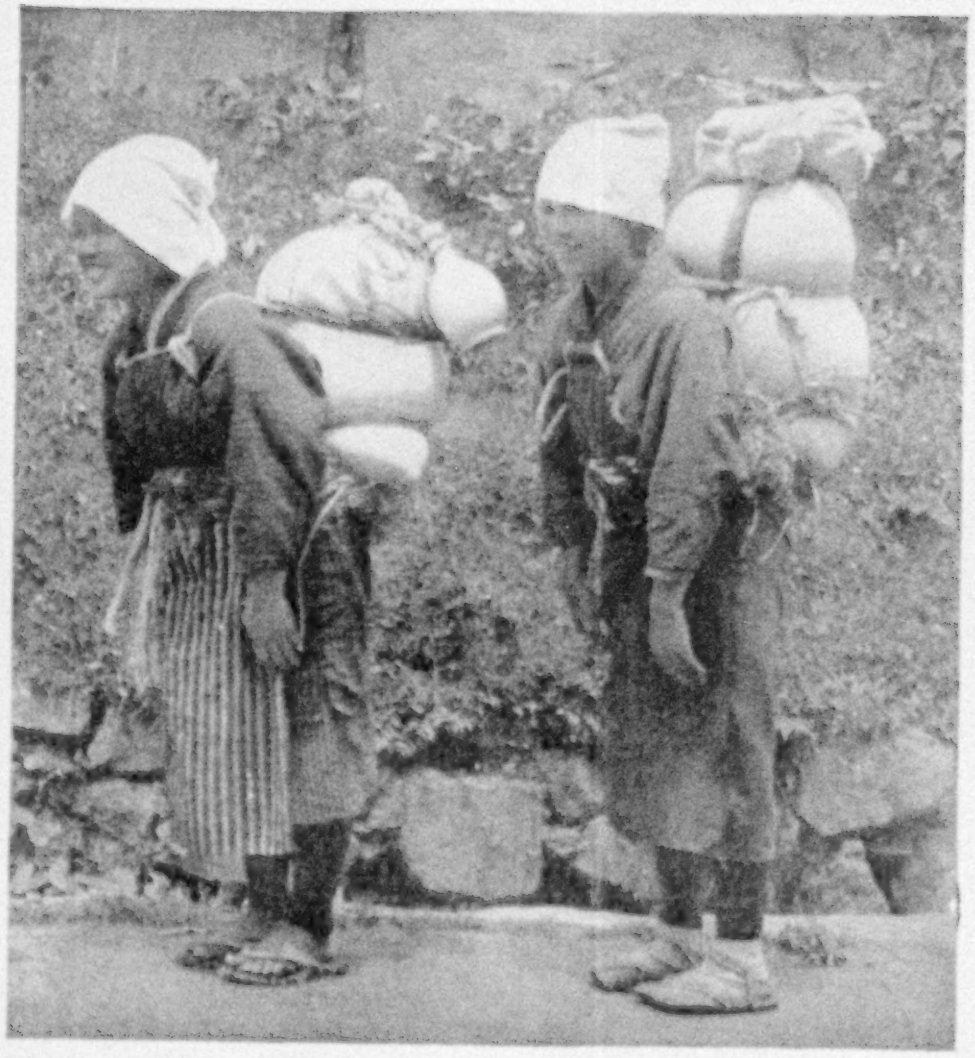
THE COMPASSIONATE GOD JIZU (SEE PAGE 997)

A little later the cherry blossoms were followed by the graceful wisterias (see page 994). The native sort were seen in luxuriant bloom, their long branches of delicate-tinted flowers suspended from an overhanging trellis resembling ropes of purple beads. Some of these strings of blossoms grow to a length of six feet. Japanese gardeners obtain splendid results with the variety commonly seen in our own country. The blossoms of this sort grow in thicker clusters and the color is deeper than the native variety.

Probably no flower impresses American tourists with the floral possibilities of Japan as does the wonderful display of azalias. Some of the gardens we visited contained acres of bushes, many of them higher than our heads, all a mass of bloom (see page 995). Then, too, the mountain-sides were tinted with the wild species. Dooryards and hotel grounds contained many single specimens of exquisite color and form. These out-of-door plants were even more beautiful than those raised in our hot-houses.

Regular Japanese houses in construction are frail frame affairs. The ever-present danger from earthquakes having

TWO CHILDREN CARRYING BABIES (SEE PAGE 999)



Photos by W. W. Chapin

PEASANT WOMEN CARRYING RICE

They romp and play, entirely heedless of the baby on the back

Photo by W. W. Chapin

PILGRIMS IN TEMPLE COURT: KIOTO (SEE PAGE 1001)

to be considered, no mortar, stone, or brick enters into their make-up, even underground foundation being dispensed with. The outer enclosing walls are of solid wood, and the windows and partitions are lattice frames covered with opaque paper, and all slide in grooves. This permits throwing the entire story into one room (see page 979). These doll-houses make the neatest, daintiest abodes one can imagine, and their simplicity of furnishing appeals to the American housewife as ideal. Rugless floors inlaid with thick straw mats, each three feet wide by six feet long and soft enough to form the foundation of a comfortable bed when supplemented by thick padded quilts, afford one the choice of having his bed made up in any part of the room he may prefer.

As walking on these straw mats with wooden sandals or street shoes would soon break the straw and make the mats ragged and unattractive, besides tracking in dirt, street footwear is left in the entry. In temples and inns this inconvenience to foreigners is sometimes avoided by the keepers providing felt socks to draw over the shoes.

No furniture interferes with sweeping and there is little to dust, since these sensible people do not make homes museums of art and curios. A small fireproof building is provided conveniently near, known as a go-down, in which is stored all of the surplus family possessions of bric-a-brac and valuable clothing. Some of the living-rooms have a little alcove and shelf, with a vase or a piece of bronze, a scroll hung on the

wall a low stand; and, if the weather makes it necessary, a brazier with a few glowing charcoals is added to warm the fingers. For the sake of variety, the vases or bronzes are occasionally exchanged for others from the go-down.

The best room in the native home is placed in the rear of the house, because it overlooks the garden. How dear to the Japanese heart is the garden, where love of nature finds peculiar expression in this land of flowers, for in no other country do dooryards contain so many artistic features within so limited a space.

One afternoon, while investigating the attractions of a brass curio-shop in Yokohama, a funeral procession, wending its way along the narrow street, ascended the steps of a near-by Buddhist temple. First came four men, each carrying a flimsy artificial tree, about three feet long, representing the lotus plant in bloom. These were followed by eight coolies bearing on their shoulders two poles about 18 feet long, from which hung the coffin. When the family of the deceased is unable to bear the expense of the full-length coffin, a smaller square one is used, the remains being placed in a sitting posture. These receptacles are sometimes too small to receive the remains without breaking the limbs.

In the present case, owing to the affluent circumstances of the deceased, the coffin was of full length, its frail construction in the style of a toy Swiss cottage. The two sides were hung with bamboo curtains of so loose a weave as plainly to show the outline of the occupant, who proved to be a woman. The remains were followed by rikishas containing the mourners and friends. Wishing to see the ceremony, we followed after the procession. On reaching the auditorium, the poles from which the coffin hung extended so far into the entrance that it was difficult to gain admittance. The altars in these temples occupy so much of the room that little is left for the people. Spaces were assigned us on the floor at the right where we could sit. In front of each one stood a tray with cigarettes and a small brazier containing a live coal to furnish light for the smoker.

The mourners were kneeling on the floor at the left. Just back of the altar enclosure stood a low stand; behind this sat the high priest, a large gong at his right, and just back of him sat two other priests with a pair of cymbals. The service consisted of prayers, repeated first by one and then another, then all three in unison, with occasional readings from scrolls, all interspersed with strokes on the gong and clangs of the cymbals.

During the service the bereaved husband passed to the front of each group of friends, including our party, knelt facing each group, and bowed to the floor. This salutation was returned by all in a similar manner, as an expression of regard and sympathy.

Toward the close of the service an attendant entered, bearing an armful of paper boxes about the size of a pound candy box, filled with small cakes and confection neatly tied. Under the string of each box was a slip with heavy mourning border and Japanese characters, which our guide translated for us as follows: "Many thanks for your honorable attendance for the funeral of Sem, my deceased wife, today. Excuse for my expressing thanks here instead to call at your residence promptly. Yours respectfully, Umesuke Saiki and relative. 19th day, fourth month, 42d year, Maji."

One of these boxes was laid on the floor in front of each person, to be carried away by him. During the early part of the service those who felt disposed smoked the cigarettes provided in the trays, and partook of tea, which was also served.

Immediately after attending the Emperor's cherry blossom garden party, on April 26, we took our departure from Tokio for Nikko by rail, 100 miles north. The railroads of Japan are under government control and splendidly managed. During our months of travel over these lines, the practical benefit to travelers of the inbred courtesy peculiar to the people

Photos by W. W. Chapin

FOUR MEN CARRYING LUMBER

SCENE IN A PUBLIC PLAYGROUND: BOYS ON THE SWINGING LOG (SEE PAGE 1002)

was always apparent in the consideration shown by employees for the comfort of passengers.

There was, however, one disagreeable feature encountered in passenger coaches: there were no restrictions as to smoking, not even in sleepers, probably because most of the men of Japan use tobacco, and also a large proportion of the fair sex are addicted to the same habit. Were a non-smoking compartment provided on each train, much annoyance might be saved to the considerable number of travelers to whom the weed is obnoxious.

No dining cars are attached to these trains, but one's hunger may be very satisfactorily appeased at the larger stations by patronizing the boys who pass up and down the platform crying their wares, perhaps not in a language clearly understood by all. However, their offerings, in neat little wooden boxes bound together in pairs by a strand of bamboo, suggest something palatable to the traveler, and, be he Japanese or American, either taste will be gratified, as some of the boxes contain rice, fish, and native food, while others include broiled chicken, bread, etc., better adapted to the Occidental taste. Then, as it is extremely unsafe to drink unboiled water in Japan and we are considering what we can wash our lunch down with, another boy approaches our car window, offering a small earthen teapot containing a drawing of tea and a cup, all for two cents of our money, and as much hot water as is desired from a large supply kettle thrown in. After the lunch is finished the purchaser is at liberty to keep the teapot and cup or toss them out of the car window.

The road from the station at Nikko to the Kenaya Hotel is the principal business thoroughfare of what remains of this once prosperous city. As our party passed along the street we were subjected to the careful scrutiny of the proprietors of the numerous curio and wood-carving shops on either side of the road, who were all standing in their doorways sizing up the new arrivals with an eye to future business.

If Japanese art has surpassed all former achievements in elaborate and beautiful mausoleum buildings in Nikko, nature here has succeeded in her efforts to furnish a setting which can hardly be equalled the world over.

The old native proverb, "Do not use the word magnificent until you have seen Nikko," is none too strong. This mountainous region, said to have originally been a cryptomeria forest, many years ago was the abode of a public-spirited ruler, whose love for these trees led him to devote considerable of his large fortune to extending the bounds of the forest by planting and caring for large numbers of trees. Many miles of the highway leading from Nikko, as a result of his forethought, are bordered by twin rows of these great towering monarchs, reaching a height of from 150 to 180 feet and with trunks 30 feet in diameter. These trees, with few exceptions, are still in a vigorous condition, a fitting and beautiful monument to his love of nature.

A very narrow-gauge railroad enters Nikko near the hotel, and, although the street crossings are at grade and no whistle or bell gives warning of the approach of a train, no lives have ever been sacrificed or serious accident occurred. The line is 18 miles in length and the motive power is a frisky bullock, which flies over the track at an estimated speed of two miles an hour. The little car, when entering Nikko, is loaded with bars of copper brought from the smelter at Ashio, where the ore is mined, and, on returning to the mines, carries coke and provisions.

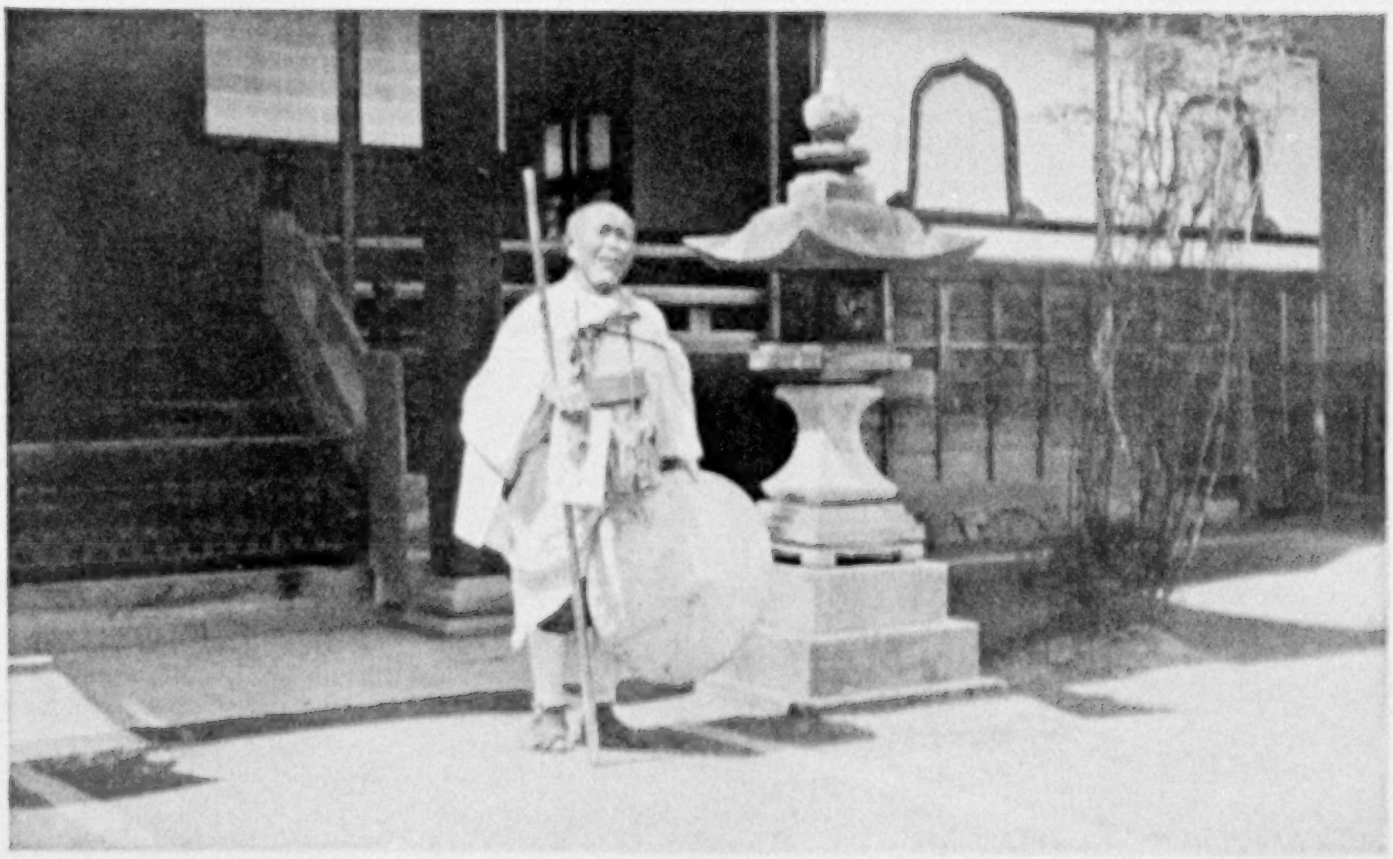
A stroll about a mile up the valley overlooking the clear, rushing waters of the Daiyagawa River brought us to a crude foot-bridge. Here, on the far side of the river from the thoroughfare, in the solitude of the forest, mantled in green moss, was a row of stone idols (see page 966). Our guide informed us that no one had succeeded in counting these images correctly; so our ladies,

OUR FRIEND, THE PILGRIM

A little old man on a pilgrimage to the shrine on the sacred mountain of Koyasan. As he slowly makes his way along the lonely path, he tinkles the little bell which hangs from his neck and chants the invocation: "May our six senses be pure and the weather on the honorable mountain be fair."

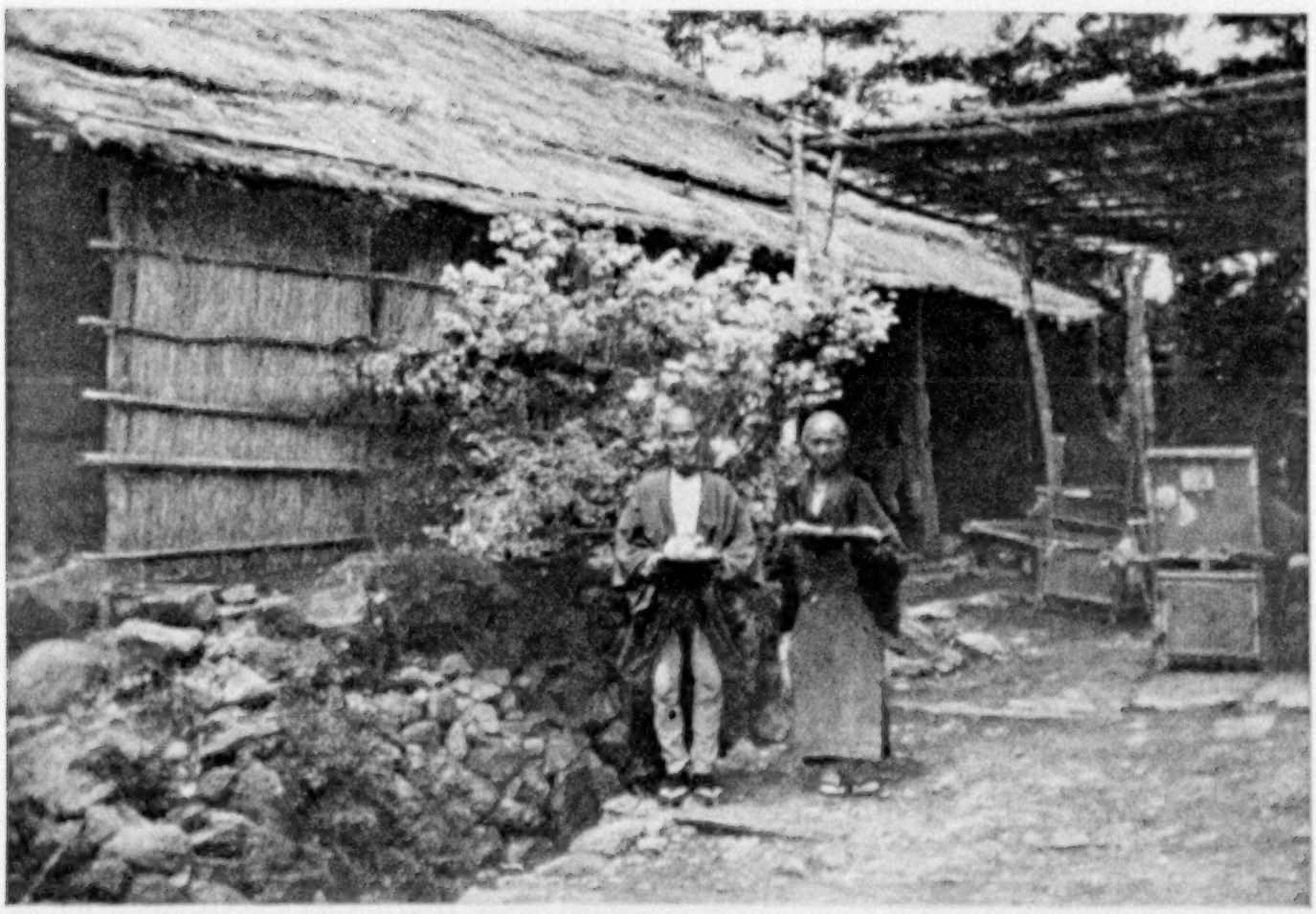
A SHINTO PROCESSION IN KYOTO

The marching ceremonies of the lower class of Shintoists suggest to the tourist the clown part of a circus street parade, so grotesque is the appearance of many of those taking part. It is possible that the display is most impressive to the faithful, but it conveys no religious significance to others.



A PILGRIM AT THE TEMPLE

This pilgrim has visited the shrine in the Temple, and is now ready to depart on his long tramp to the place he must visit to make his next sacrifice. The "water lantern," so-called, at the left of the pilgrim, is the most graceful in outline of all the Japanese stone lanterns.



A WAYSIDE TEA HOUSE

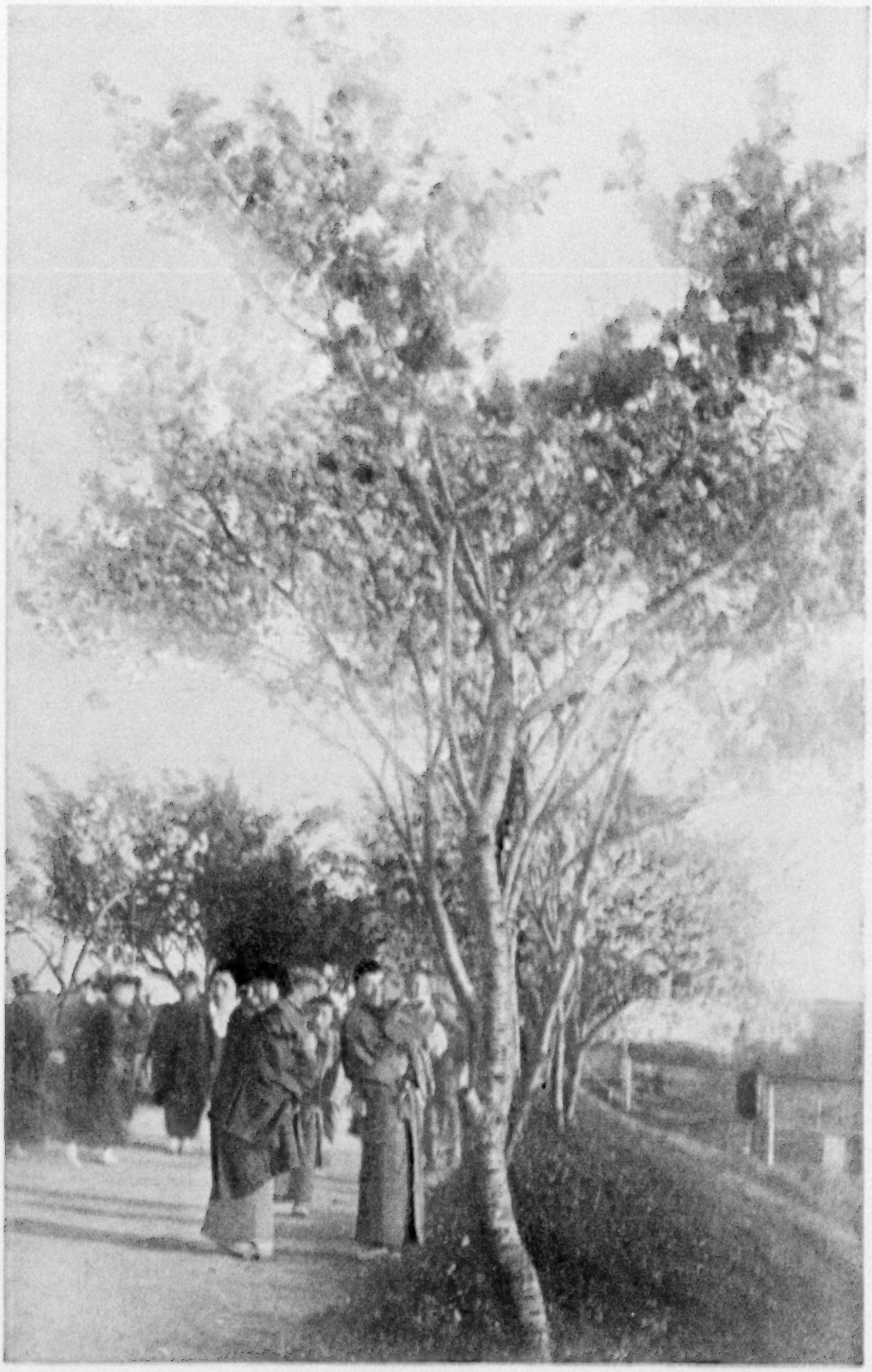
Tea houses in Japan are most welcome and opportune resting places in the day's journey. Visitors are usually served by young women, who not only fill the place of waitresses but are charming hostesses. At the wayside inn in the picture the old couple were most considerate of our comfort.

NUNS SOLICITING ALMS

In the right hand of each nun is a little hammer, which is used to strike the small metal gong attached to the belt to give notice of their approach, so that a person may be prepared to make a contribution. If the coin is forthcoming the nuns deposit it for the time being in the box hanging at their side.

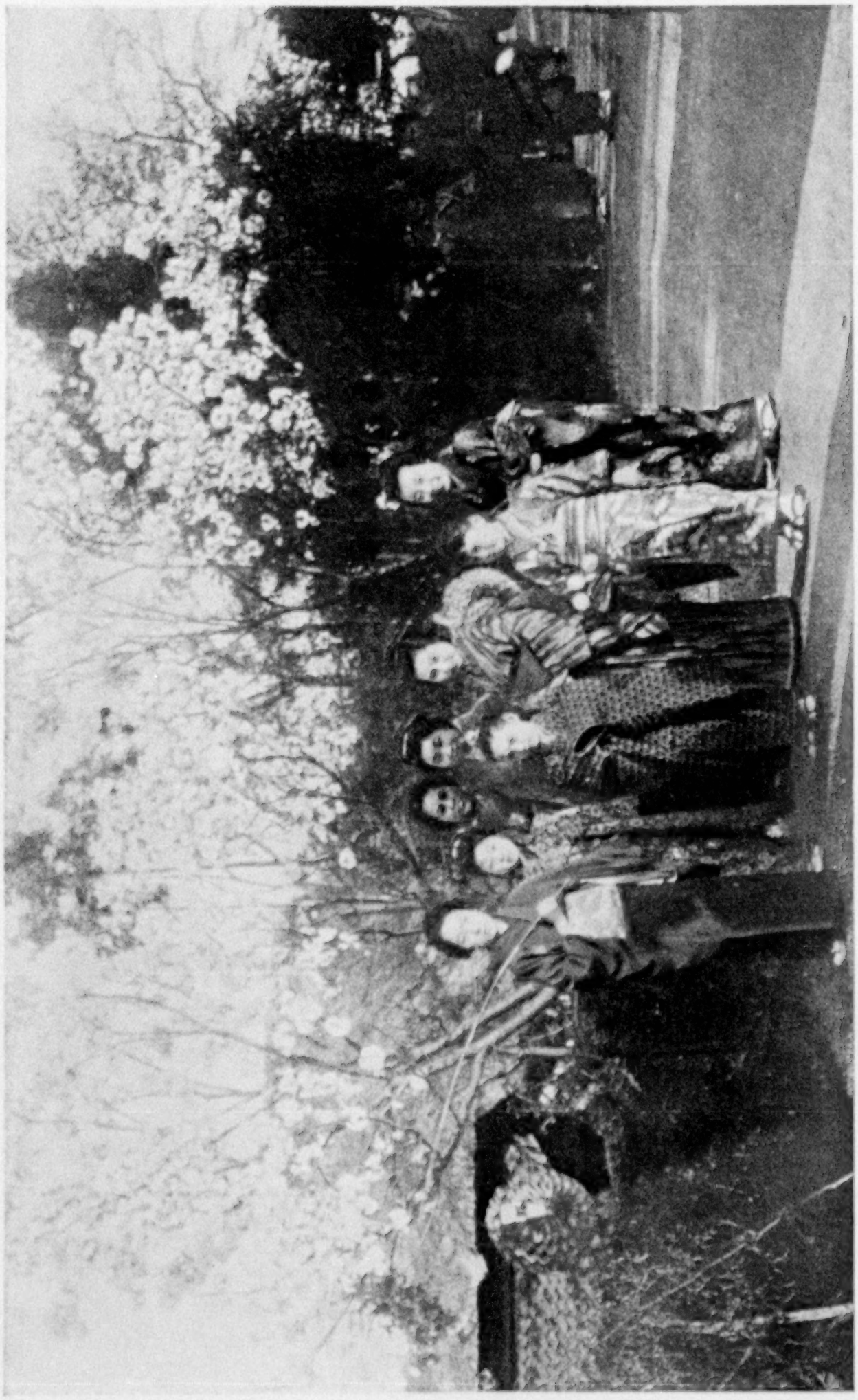
ARAKAWA RIDGE AND TOURISTS' RIKSHAS

One of the drives most frequented by tourists desiring to view the soft beauty of the cherry trees in blossom, and which affords a splendid opportunity to mingle with the natives who throng this magnificent stretch of five miles.



A VIEW OF ARAKAWA RIDGE

Many years ago this double row of cherry trees formed a delicate lace-like edging for the highway, which extended seventy miles, being even more beautiful than it is today.



A GROUP OF DANCERS

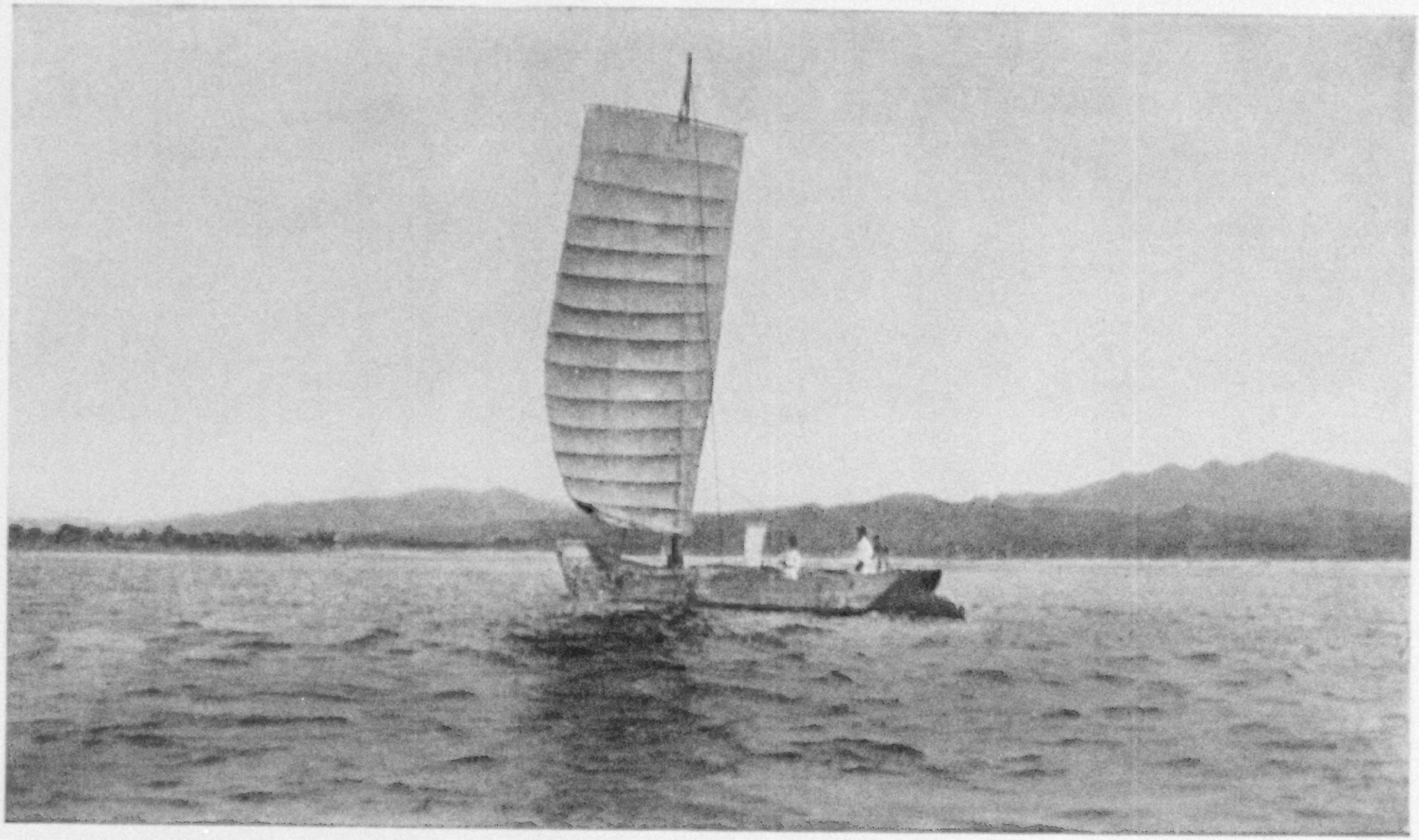
One of the numerous bands of musicians and dancers, who stroll up and down the Arakawa Ridge, entertaining the crowds as they promenade among the pink and white cherry blossoms.

THE INTERIOR OF A JAPANESE HOME *By permission of F. C. Hicks*

This glimpse of the interior of a bamboo-and-paper house gives an idea of how Japanese ladies enjoy their cup of tea. It is second nature for the natives to sit in this position, and they are perfectly comfortable, but Europeans find it a very different matter.

THREE LITTLE MAIDS FROM SCHOOL

The Japanese maidens are so natural and graceful in choosing their own postures for pictures that it is unnecessary to pose them to obtain artistic results.

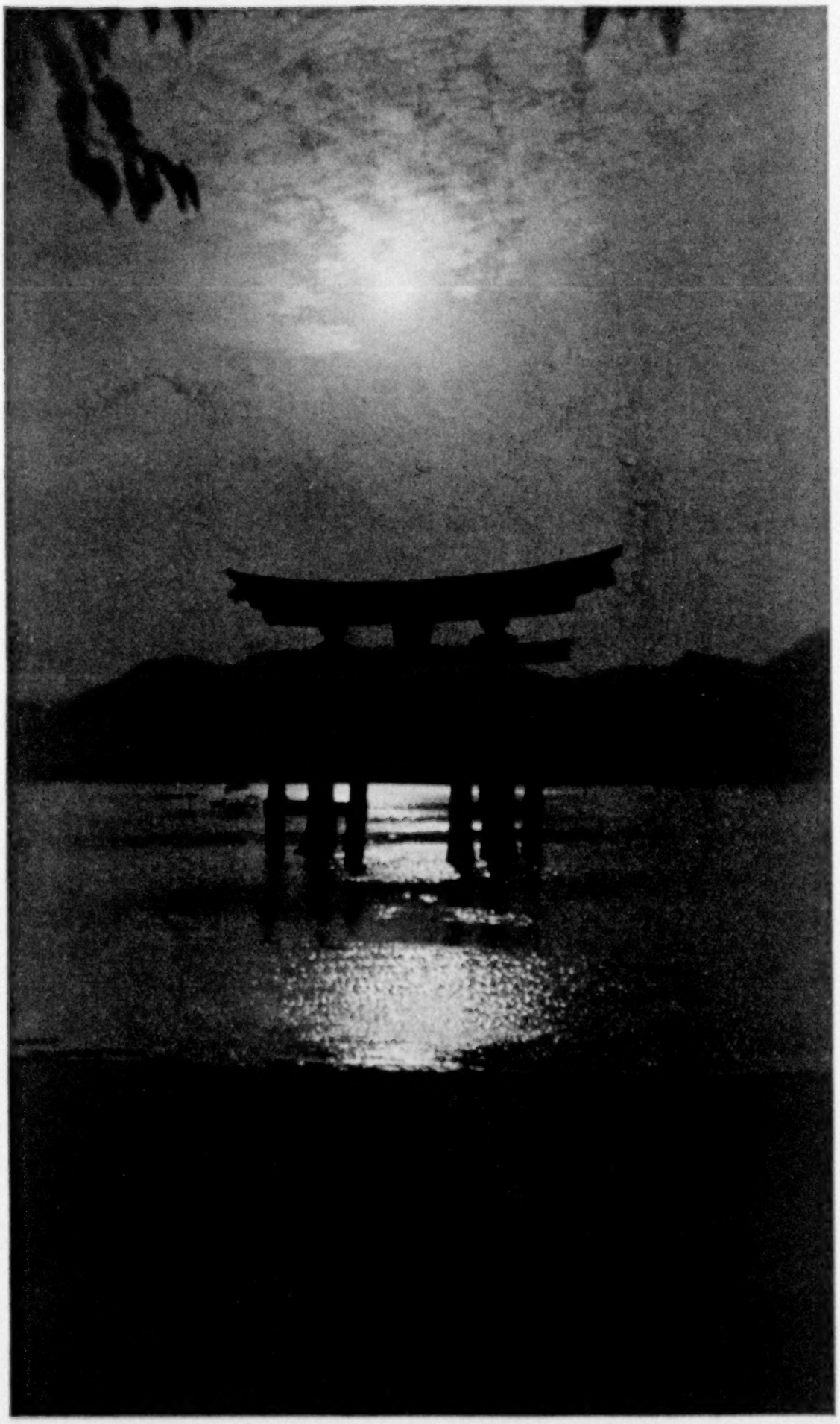


A SCENE ON THE JAPANESE INLAND SEA

The variety of sailing craft seen on these beautiful waters includes many trading junks and fishing boats of strange and unusual form.

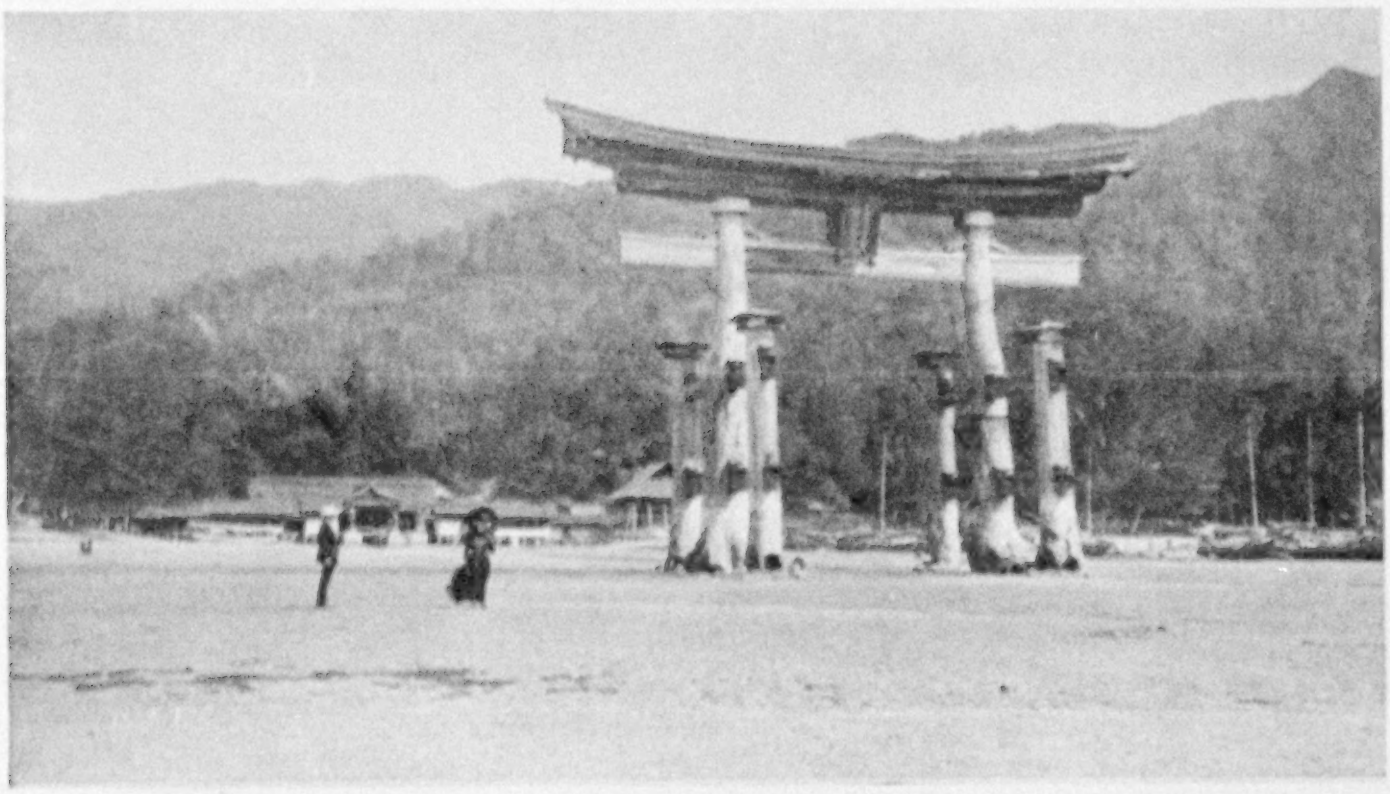
GEISHA GIRLS

A stone lantern, a summer-house, several iris blossoms, and three geisha girls create an artistic picture, without the slightest necessity for posing.



THE GREAT TORII AT MIYAJIMA AT HIGH TIDE

Rising from the sea, a quarter of a mile from the shore, stands this old emblem. As the traveler sails into the beautiful harbor of Miyajima, he will be impressed by the sight, and reminded that not only is the ground sacred upon which he is about to stand, but the sparkling waters of the beautiful bay as well.



THE GREAT TORII AT MIYAJIMA AT LOW TIDE

It is interesting to note the effect of the constant lapping of the waves in their endeavor to wear away the old logs where they rise above the sand.

YOUTHFUL DANCERS

There was no representative of the society for the prevention of cruelty to children in sight to interfere with the dancing of the little ones. They were very graceful, and, being clothed in kimonos and obies similar to those worn by adults, appeared much older than they were.

THE GARDEN AT FUJIYA HOTEL: MIYANOSHITA

This beautiful garden at Miyanoshita has two cascades within its narrow confines, and its quaint charm is a source of delight to the many visitors.

DANCING GIRLS

Many tourists on their arrival in Japan, wishing to obtain their first meal of native food and be entertained by the dancing- and geisha-girls, repair to the Maple Club, in Toyko. The girls in the picture are some of the graceful dancers who charm all visitors.

THE PAGODA AT MIYAJIMA

The view of the bay from this little pagoda shrine, built upon one of the steep hills on the sacred island of Miyajima, well rewards one for making the climb.

A CHARCOAL CARRIER AT NIKKO

The bundle of charcoal in the picture would be considered a large load for an able-bodied man, but this woman seemed to mind it very little, so accustomed was she to the hard work.

FISH BANNERS RAISED IN CELEBRATION OF BOYS' DAY

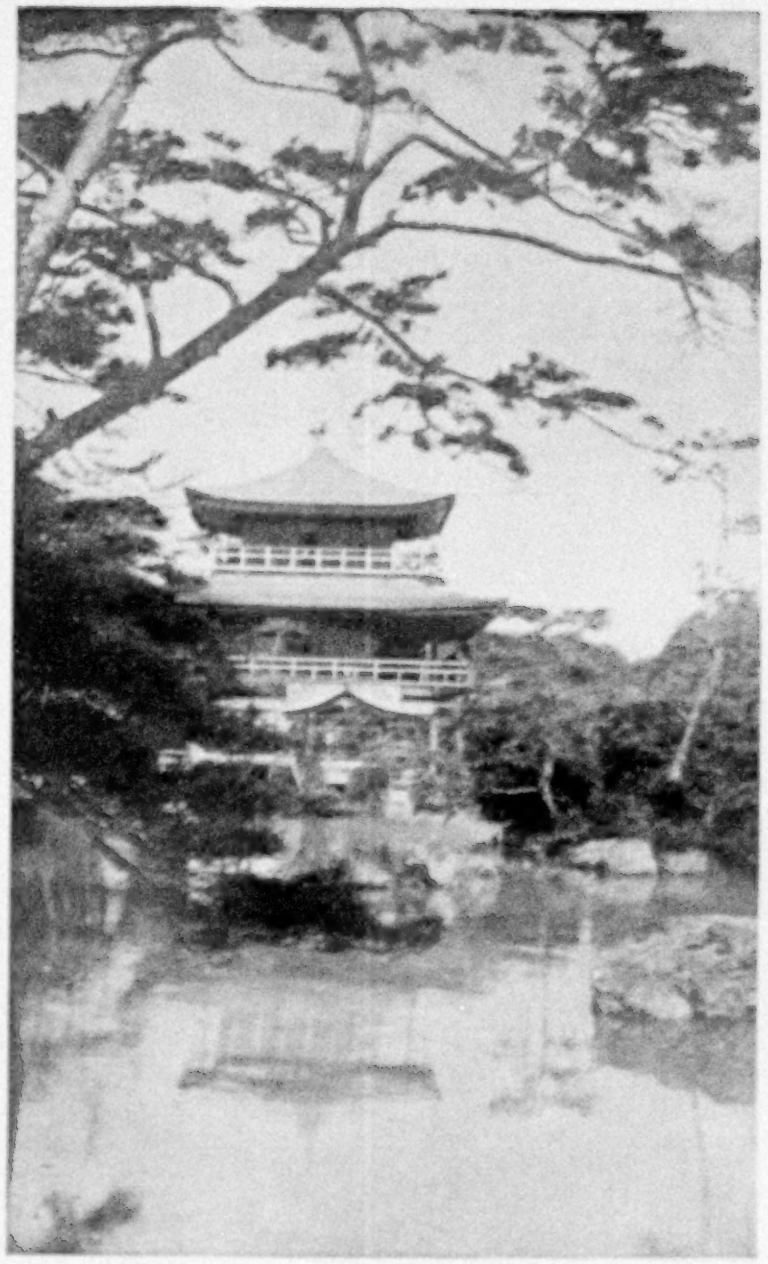
Of the long list of Japanese anniversaries observed throughout the realm, none receive a more spectacular celebration than does "Boys' Day," on May 5th of each year. The dwelling place of every boy who has arrived from Storkdom during the preceding year is indicated to the world by these peculiar fish banners raised on high.

THE MAUSOLEUM TEMPLE OF THE FIRST SHOGUN: NIKKO

Standing in the midst of a forest of great cryptomerias on the mountainside, in Nikko, is the tomb of Ieyasu, the first Tokugawa shogun (1542-1616), one of the greatest generals, as well as the greatest ruler, Japan has ever produced. The picture shows one of the Temple buildings which stand in front of the tomb.

A BRIDE IN A RAILWAY COACH

A young bride on a short journey, chaperoned by her mother. Those who have traveled on the railways of Japan will recognize the ever-present cuspidore, fastened to the floor in the center of the car, and over which they have so often stumbled in days gone by.



THE GOLDEN TEMPLE

In a suburb of Kyoto and encircled in a setting of beautiful pine trees stands this little gem of Japanese architecture. Its graceful lines are enhanced by the reflection in the clear waters.

THE NATIVE AMBULANCE

It would be uncomfortable enough for a person in robust health to be carried for any distance in this tomb-like contrivance; therefore the effect on one weakened by disease of being shut within such narrow confines can readily be imagined.

A DRUG STORE

No sound of a sizzling soda fountain is heard as one approaches a drug store in Japan. Owing to great danger in drinking unboiled water, hot tea is the staple beverage usually served throughout Japan in drug stores and elsewhere. It is also served in many of the large stores dealing in merchandise, the proprietor sipping a cup of tea with his prospective customer before the shopping begins.

BURDEN-BEARERS

Tourists who visit Japan for the first time often express pity for the burden-bearers of the country. While most of the men would gladly accept the sympathy if expressed in yen (coin), they would be much amused at the thought of deserving commiseration, so accustomed are they to the work.

A PEASANT CARRYING BARK

The woman in this picture seemed to us especially deserving of pity because the weight of the load looked so out of proportion to the little body supporting it.

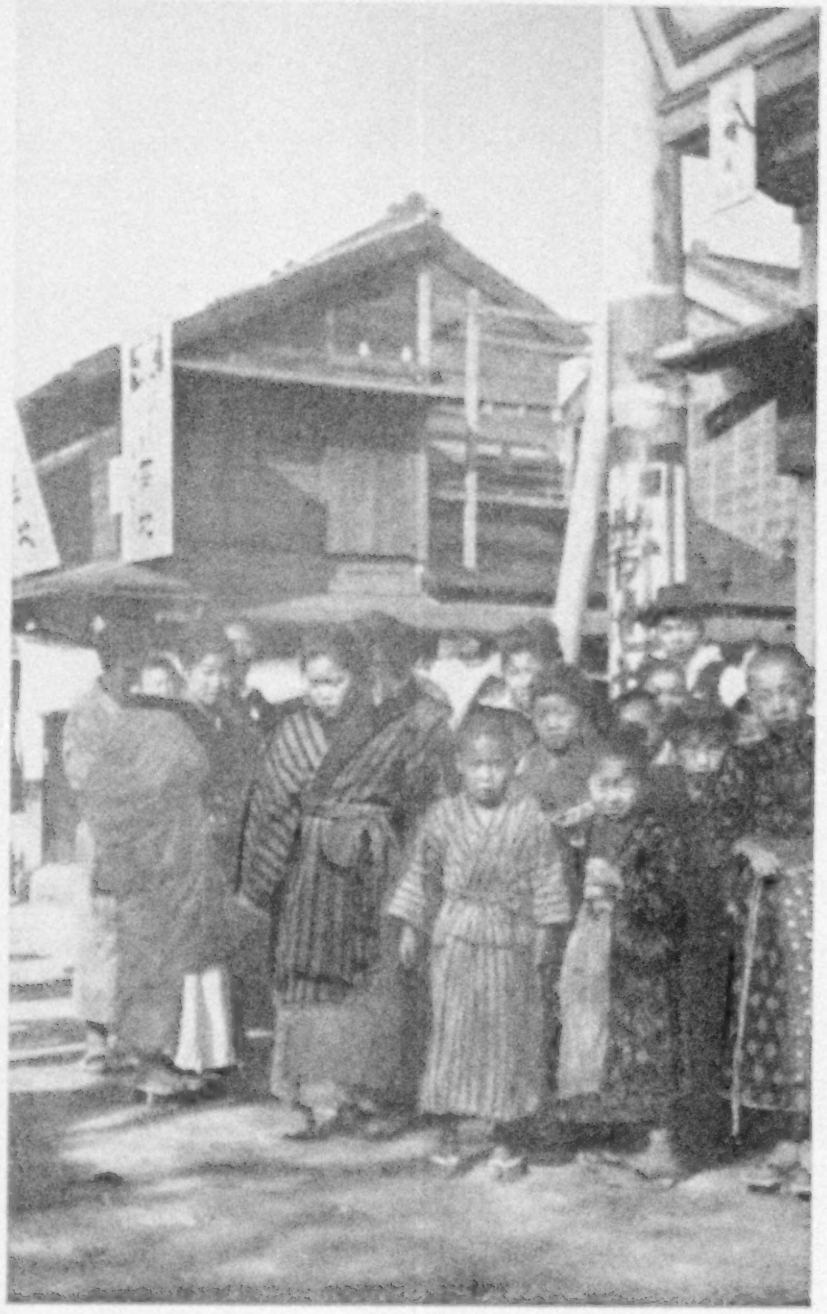
WOMEN CARRYING WOOD ON KOYOSAN MOUNTAIN

Horses are almost unknown in the mountainous parts of Japan, and the roads are not adapted to wheeled vehicles, so everything has to be carried on the backs of the people.

XUM

A MOTHER AND BABE

When a Japanese mother goes out she generally takes her baby with her. This picture shows a young mother about to enter the Temple, where she will ring a bell to arouse the sleepy god, that he may pay attention to her, and then offer up her prayers.



WATCHING A "KODAKER"

In some localities Americans are objects of courteous curiosity to the townspeople, especially when taking photographs.

PEASANT WOMEN AND THEIR BURDENS

The women burden-bearers of Japan do not seem to regard their lot as especially hard, even when the child suspended from the shoulder has to be carried along with the two baskets hanging from the pole; for is there not a possibility that some day the little one may become ruler of Japan!

UNDER THE WISTARIA

By permission of F. C. Hicks

Japanese gardens having trellises of this peculiar variety of wistaria are most beautiful, and the long pendulous clusters of shaded purple blossoms, suspended like ropes of beads, sometimes grow to a length of six feet. The American variety of this magnificent climber was named in honor of Caspar Wistar, an eminent American anatomist.

THE AZALIA CORNER IN A JAPANESE GARDEN

The relationship between the Japanese and their flowers is strongly suggestive of the bond that exists between parent and child: patient, affectionate care, pride in their success, and pleasure in their companionship.

A GROUP OF NURSES WITH THEIR LITTLE CHARGES, AND TWO MENDICANT NUNS

From a tourist's viewpoint, most of the young women of Japan appear to regard life and its burdens as a huge joke, or at least they seem bound to look cheerful.

who straightway set about the task of settling the matter once for all, soon announced the number as 78, but were told they were wrong. After recounting several times with the same result, they were informed they had omitted the shadows in the count.

The temple and mausoleum of the first Shogun in Nikko (see page 987), built in the 17th century, located on the side of a mountain, surrounded by a magnificent grove of cryptomerias, probably comprises the finest examples of ancient architecture in Japan. Each individual building is a gem and has features of especial interest, including exquisite carving, massive tiled roofs, and wonderful bronze and lacquer work.

Throughout this big wood were scattered little temples and shrines in large numbers showing indications of great age. Many of the presiding images were prostrate, with arms and sometimes head separated from the body, all bearing evidence of disastrous conflicts with the evil spirits they were placed here to repel.

On the mountain far above the old tombs winds a narrow trail, which leads from the back country. The peasant woman bearing a load of charcoal on her back (see page 986) had carried her burden three miles. On delivering it to its destination, one mile further on, she was to receive the equivalent of 15 cents for the service.

One of the most enjoyable parts of Japan from our point of view is the mountainous region of Miyanoshita, four hours' journey from Yokohama by steam railway, electric tram, and rikisha. The hamlet is located well up on the side of a mountain overlooking the valley through which races a saucy little stream. To those fond of hot-water baths, the Fujiya Hotel, at Miyanoshita, is most attractive, since the waters of the hot springs which have made the place far-famed are on tap in each guest-room of the hotel.

From here the distant mountains afford vistas of rare beauty, but one has only to turn his gaze to the rear of the hotel for a nearer picture, which will hold him entranced (see page 984). Through the typical Japanese garden a rushing stream of crystal water tumbles over the rocks, the wild azalias adding their brilliant hues, and the *tout ensemble* making a fit setting for the dainty little proprietress, whose presence completes the charming scene. Soon after retiring, on the night of our arrival at the Fujiya Hotel, we were startled by a distant jarring and rumbling sound, which appeared rapidly to approach the house. Soon one side of our room became involved; then, with increasing violence, the opposite side, until the entire building seemed to be tumbling. On rushing into the hall, the proprietor was met, who, perfectly calm and undisturbed, remarked that it was only an earthquake, a frequent occurrence in that locality. This was reassuring for the time being, until reminded that earthquakes caused the loss of 30,000 lives in 1703 and twice that number in 1855 in the city of Tokio, only about 60 miles distant, and that geologists had stated that the very ground on which we were standing was forced up out of the depths of the sea by seismic and volcanic agencies, with no assurance that it was not at that very moment considering returning into the depths again.

This little Empire seems to have more than its share of underground activity, since estimates based on the records of former years indicate that just an ordinary crop should produce 500 jars of quakes per year, or nearly one and one-half shakes each day, and there are 51 active volcanoes on the island.

From Miyanoshita delightful excursions are made to the surrounding towns on the native chairs. Many tourists visit the beautiful Lake Hakone region, where Fujiyama, Japan's greatest sacred mountain, is frequently caught admiring its own snowy nightcap, gazing down into the mirror-like waters of the lake from its height of 12,365 feet above. About half the distance from Miyanoshita, a few steps to one side of the road, cut in relief on the face of a great rock which

XUM

forms part of the mountain, may be seen one of the best examples of earlier Japanese carving, a representation of the compassionate god, Jizo (see page 967).

The city of Kioto has the unusual distinction of having been a capital city for 1,100 years. It is finely located on the side of a hill in a region of great natural beauty. Nine hundred temples are within its borders, and probably no Japanese city can boast of a larger number of curio shops with such interesting contents.

The native bamboo box-shaped affair shown on page 989, which bears its suffering occupant through the streets of Kioto, in no way suggests the up-to-date automobile ambulance which rushes through our streets on its life-saving mission, although both are used for the same purpose. The two bearers of the litter handled their burden with extreme care to avoid jarring the sufferer, and, as the load taxed their strength, frequent stops were made to rest and shift the burden to the other shoulder. On these occasions the short pole carried by each man is placed upright under the long one, to support the weight and avoid resting the car on the uneven ground.

A considerable portion of the people of the Island Empire belongs to the class who "go down to the sea in ships," which probably accounts for the unique form in which the old pine in the center of the court of one of the temples in Kioto has been trimmed (see page 1000).

It is not uncommon to hear the remark that Japan has become a Christian nation. The belief that her Christian progress must have kept pace with her wonderful strides in other directions is probably responsible for this. However, facts will not bear out the statement. In its efforts to evangelize Japan, or even to bring her to that state of christianization where as a people she could be classified among Christian nations, the church is confronted by conditions which will require Herculean efforts to overcome. Buddhism, which for centuries has held such a powerful grasp on the Japanese, has awakened from its lethargy and is now making aggressive advances. Also Shintoism, the religion of the state since a very early period, though with absolutely no moral teaching—the only requirements from followers being embodied in the two rules, "Follow your natural impulses and obey the Emperor's decrees" and "Worship and make offering once each year at a temple"—has a strong hold on the people, as evidenced by their numerous visible gods, thousands of magnificent temple buildings, schools, priests, festivals, and processions, with all their attending pomp and display, which so strongly appeal to this people born and bred in the faith.

In the city of Kioto alone, with a population of about 450,000, there are three times as many Buddhist priests as the Presbyterian Church has ordained men in the mission field of the entire world. When we consider these conditions in comparison with the few missionaries, the small number of church and school buildings, with their limited equipment, and the unobtrusive, unspectacular methods which characterize the followers of the Man of Calvary, is it to be wondered that progress is slow and discouraging to the devoted people who have given their lives to His work? On the other hand, it is quite remarkable that in the face of so many obstacles, after 50 years of work in Japan, self-supporting and self-propagating native Christian churches have been launched in all of the larger cities, and that many educational institutions are scattered throughout the realm, such as the Doshisha College in Kioto and the Aoyama Gakuin in Tokio, and all of these as the direct result of missionary effort.

We are frequently asked, "Is the Japanese distrust of the honesty of their own people so great that positions of trust are given to Chinamen?" Our attention having been called to this subject previous to sailing to Japan, we were throughout our stay interested observers of the situation, with the result that we were unable to discover the slightest foundation for the insinuation and were informed that no Chinamen are employed

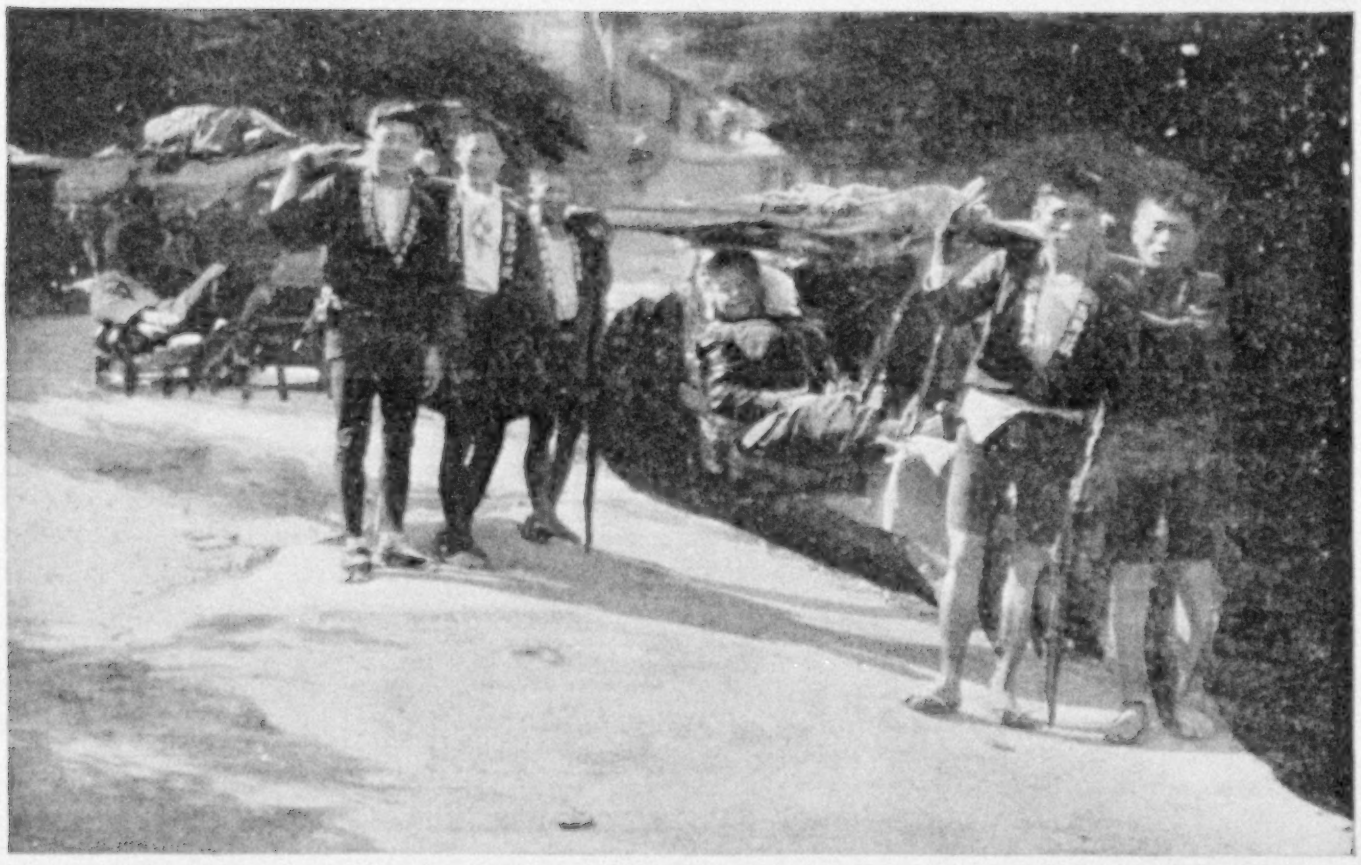


Photo by W. W. Chapin

THE WAY WE ASCENDED KOYASAN (SEE PAGE 1001)

in Japanese banking houses. Tourists who reported to the contrary probably based their statements on observations made in the Hongkong-Shanghai Banking Corporation, where their letters of credit were payable. This institution is a Chinese-English bank, and would naturally employ only its own countrymen.

In recognition of Shintoism as the state religion, the Emperor every year, about the middle of May, sends a representative to Kioto bearing a message engrossed on a scroll. The imperial document is conveyed in this form to avoid the Emperor's personal attendance.

Our arrival in that city was timed so that we might witness the interesting event. Although we were unable to appreciate much of the significance of the strange scene, it was a rare opportunity for studying the people, who were there in great numbers, including many farmers and peasants from the interior, and all in holiday attire. The variety of colors in the bright sunshine reminded one of views in a great kaleidoscope.

The procession preceding the ceremonies consisted of priests, horsemen, and footmen, many of them wearing ancient costumes and armor of feudal times, with an occasional float decorated with brilliant blossoms, while the imperial message was borne in a large cart, handsomely decorated in gilt and bright colors, and drawn by two jet black bullocks (see page 974).

The children of Japan begin to take up life's burdens and cares at a much earlier period of their existence than the children of America. Be they boy or girl, from the age of four or six the newer baby of the family becomes almost their constant companion. In fact a close attachment suddenly develops, which daily fastens the little tot on the back of the other (see page 968). As both become accustomed to the situation a mutual love and fellowship springs up, and no inconvenience is expressed, even when the older is romping and playing tag, all unconscious that the little head behind is helplessly bobbing around as though about to drop off while baby sleeps.

Photo by W. W. Chapin

A PINE TREE TRIMMED TO THE FORM OF A BOAT (PAGE 998)

Whether it is contrary to the nature of Japanese babies to cry or the shaking up by their little nurses was satisfying to them and kept them quiet was not apparent, but we do not recall a single instance of having heard a baby cry while on the back of its little nurse.

When there is no older child in a family to care for the newcomer, a nurse-girl is employed; but even then baby does not ride out in a perambulator, for that conveyance is reserved for the use of father or mother. A bevy of these young women, neatly clad in bright kimonos, each one carrying her charge on her back and all chatting and laughing at the same time, formed a frequent and attractive street scene (see page 996).

It is said that the nuns of Japan comprise two classes, the one devoted to the relief and comfort of the sick and suffering, while the other (see page 975) is practically a public charge, being most successful beggars, going from door to door intoning prayers, tinkling the bell and little gong.

The Golden Pavilion (see page 988), the exterior of its third story being in gilt and from which it gets its name, was originally built in the 14th century and recently restored. It stands on the edge of a little lake surrounded by pines, forming one of the suburban beauty-spots of Kioto. The graceful lines of the building suggest the pagoda form, with the upper roof crowned by a bronze figure of the phœnix.

We were greatly favored one afternoon, when en route from Kioto to Gifu, by the entrance in our car of a bride accompanied by her mother. She was gowned in five kimonos, the different colored facing of each garment plainly indicating the number. We were informed that the wearing of these robes was not for protection from the severity of the May weather, but to avoid the necessity of a Saratoga trunk.

Some of the hair ornaments worn by the bride were in style many years ago, but now are seldom seen. The band of pink silk covering her hair is said to be worn to prevent the growth of the horns of jealousy, so unbecoming to a bride.

By the sweetening influence of some chocolate and the promise of a copy to send to a soldier brother, our interpreter obtained permission to take her picture (see page 988).

As lovers of nature we felt amply repaid for the hardship of the long but interesting ride to the summit of the sacred mountain, Koyasan, four miles of the route by rikisha and ten miles carried in native baskets, known as kagos (see page 999), each one hung from poles on the shoulders of three coolies. This means of conveyance with a Japanese passenger appears to the observer extremely comfortable, but if a foreigner can ride a mile in one and still look pleasant he must have an unusual make-up.

The trail to Koyasan leads up a very steep but marvelously beautiful mountain, the last four miles being through a forest of enormous cryptomeria and cypress trees. There being no inn, our courier obtained accommodations for us in the Buddhist temple Shojo Shin-in. We were supplied with wholesome native food cooked and served by acolytes. These embryo priests made up our beds on the floor and in every way looked after the comfort of the party during the three days of our stay. Several of the temples on Koyasan Mountain are among the oldest in Japan, dating back 1,100 years, and are more beautiful than many of the modern buildings. Among the most attractive of these buildings is the artistic old tower which shelters the great bronze bell, which has boomed out the hours for centuries.

In parts of Japan members of associations of the poorer classes contribute a small sum monthly to a common fund. At a stated time several persons are chosen by lot to represent the rest in a pilgrimage to certain shrines (see page 969), all expenses being paid by the association. When en route to Koyasan we overtook one of this class, the old fellow (shown on pages 973 and 974), with staff in one hand, tinkling bell in the other, slowly trudging up the steep incline to fulfill his obligation at the shrine on the summit of this sacred mountain.

The narrow strip of woods comprising the old burial ground, near the temples on Koyasan, is a mile in length, and, from the great numbers of monuments and tombstones crowded into the space, "standing room only" must be the rule. Kobo Daishi, the most celebrated of Buddhist saints, founded this cemetery in the ninth century, and, owing to his tomb being within the enclosure and the special privileges in the hereafter believed to be derived from even a nominal burial beside this godly man, all the great families of Japan are represented in the great collection of stones; not that their remains are actually interred here, a tooth or any part of the anatomy being sufficient to gain the coveted benefit.

The funeral tablets of those represented in this burial place stand in rows of thousands along the wall of the memorial hall in the temple. Daily service is conducted at this shrine at 5 o'clock in the morning. The officiating priest extended an invitation to attend this service the morning after our arrival. The hour had arrived before we were awakened, and, not wishing to miss any part of the service, little time was devoted to dress.

On entering the hall the 11 priests and acolytes, with heads shaven, their feet bare, and robed in vestments of two shades of yellow, were kneeling in prayer. The entire service was intoned on one note, but each priest was singing in a different key, punctuated with the occasional clang of cymbals and the rich, deep tone of the great gong. The combination formed a most weird and remarkable harmony, which, together with the surroundings and the hour, contributed to the impressiveness of the service.

Conspicuous among the few shops in Koyasan village is the drug store (see page 989). The entire front of the store is hung with vertical signboards, calling attention to the great variety of remedies and goods dealt in. These signs, being hung with hooks and eyes, are easily taken down at closing time.

The good-roads movement, which has made such progress in our own land since the automobile became popular, has not yet reached the interior of the Mikado's realm, so everything has to be carried on the shoulders or back. In our observation most of the burden-bearers were women. The reason for this was not apparent, and was certainly not because of any inclination toward laziness on the part of the men, for they all work in Japan. On some of the mountain trails picturesque though pathetic instances of the overloading of the little women were occasionally met.

Little is known of the origin of the "torri." Some writers claim its form is a derivation of the Chinese character meaning heaven, and that it was introduced into Japan with the Shinto cult, while others state that it was originally a perch for the sacred birds. The torri is one of the most picturesque objects peculiar to Japan. It marks the approach to both Shinto and Buddhist temples, those belonging to the former being sometimes distinguished by a piece of rope stretched along the cross-beam, which symbolizes purity. To this rope is also attributed the power of protection from evil spirits.

A large and most picturesque torri is at Miyajima, the sacred island of Japan. Standing out in the sands a quarter of a mile from shore at high tide, it is a very conspicuous object in the beautiful bay. If attractive in the daytime (see page 983), it is doubly so under the light of the moon (see page 982).

The swinging log (page 971) proves that the playground movement is not confined to America. This novel amusement was very popular with the youngsters of Nara, and some of them were quite expert in keeping their footing when it was in motion.

Throughout Japan May 5 has a peculiar significance. This is indicated by the strange baglike fish banners seen floating from the flagstaffs, distended to their full size by the wind. The banners proclaim that some time during the preceding 12 months the stork has made a visit and left a small boy, and the friends of the family have greeted him with carp flags instead of flowers (see page 987).

Judging from the numerous homes displaying these emblems, his storkship must have worked overtime. Various reasons are given why the carp, of which our goldfish is a variety, was chosen for this purpose. On the occasions of large dinners, as an especial feature, a live carp is served on a board, each guest cutting a piece, which is afterwards eaten raw. The fish is said to endure the carving without a flinch, which makes him an emblem of bravery. His other qualification lies in his ability to swim a stream against the current, even to ascending a waterfall, symbolizing that he overcomes every obstacle.

If we criticise the Japanese in some of their ways, the fact remains that in many directions we could very profitably profit from them; for, all in all, where can be found a more happy or contented people? Two elements which contribute much to this condition appeared to us to be the simple life, which is so much talked of but so seldom realized in our own land, and their love of the beautiful in nature and considerateness for others, as evidenced in their extreme courtesy.

THE KINGDOM OF FLOWERS

An Account of the Wealth of Trees and Shrubs of China and of What the Arnold Arboretum, with China's Help, Is Doing to Enrich America

By Ernest H. Wilson

THE Chinese Empire is frequently referred to as the "Flowery Kingdom"; but, as the Chinese language indicates "words" and "children" as "flowers," the vegetative wealth of the country may not be intended. However, be this as it may, I hope in the course of this brief article to show that much of China proper is a real kingdom of flowers.

Since the dawn of culture in China, away back when the ancestors of modern nations were untutored savages, the people of the Celestial Empire have been fond of flowers. An odd plant is to be found in the dwellings of the poorest class, and the courtyard of the shopkeeper and inn-keeper always boasts a few plants of one sort or another. The temple grounds are frequently most beautiful, and attached to houses of the cultured and wealthy are gardens often of much interest. In the neighborhood of wealthy cities like Soo-chow, Hancan, and Canton are gardens famed throughout the length and breadth of the Empire.

In these Chinese gardens, as in Japan, a love of the grotesque predominates, and the landscape effect is essentially artificial. The Japanese have carried their skill in this direction very much farther than the Chinese, but undoubtedly the art originated in China.

The Chinese do not cultivate a very great variety of plants, and the subjects found in any good garden are common to all such gardens. To all the plants they cultivate, the Chinese attach some peculiar significance and value them accordingly. Purity of color and form, gracefulness in habit, and delicacy in fragrance are the qualities chiefly appreciated. Moutan pæonies, chrysanthemums, flowering peaches and plums, winter-sweet (*Chimonanthus fragrans*), heavenly bamboo (*Nandina domestica*), sacred lily (*Narcissus tazetta*), lotus lily (*Nelumbium speciosum*), lan-hwa (*Cymbidium sinense*), kuei-hwa (*Osmanthus fragrans*), bamboos, various conifers, camellias, and azalias are general favorites, and some or all are to be found in every Chinese garden. Though the cultural skill consists very largely in dwarfing and training these plants into grotesque shapes, it in no sense robs the flowers of the qualities attributed to them by the Chinese. The figuring on Chinese porcelain (and what porcelain can approach this marvelous product of Chinese skill?) is symbolical of the Chinese love of the grotesque and beautiful among flowers.

China is a land of contrariety—a land where no general statement or observation holds good. In spite of their love for grotesque and artificial landscape effects in their gardens, the Chinese have a strong appreciation of natural beauty. This is evidenced in the sites chosen for their temples and shrines. Apart from situation, which is perfect, groves and avenues of magnificent trees are often planted.

THE MAIDEN-HAIR TREE

Though a few deciduous trees are usually to be found, evergreens always have distinctive preference. In the temples around Peking are noble avenues and woods of arbor-vitæ (*Thuya orientalis*), elm (*Ulmus pumila*), and sophora (*S. japonica*); in the south, center, and

Photo by E. H. Wilson, Arnold Arboretum

A BEAUTIFUL MAIDEN-HAIR TREE (*Ginkgo biloba* Linn.): TREE 90 FEET BY 24 FEET: NEAR KIATING, 1,100 FEET

The ginkgo is one of the most ornamental broad-leaved conifers known. It is the last survivor of a very ancient race (see page 1006)

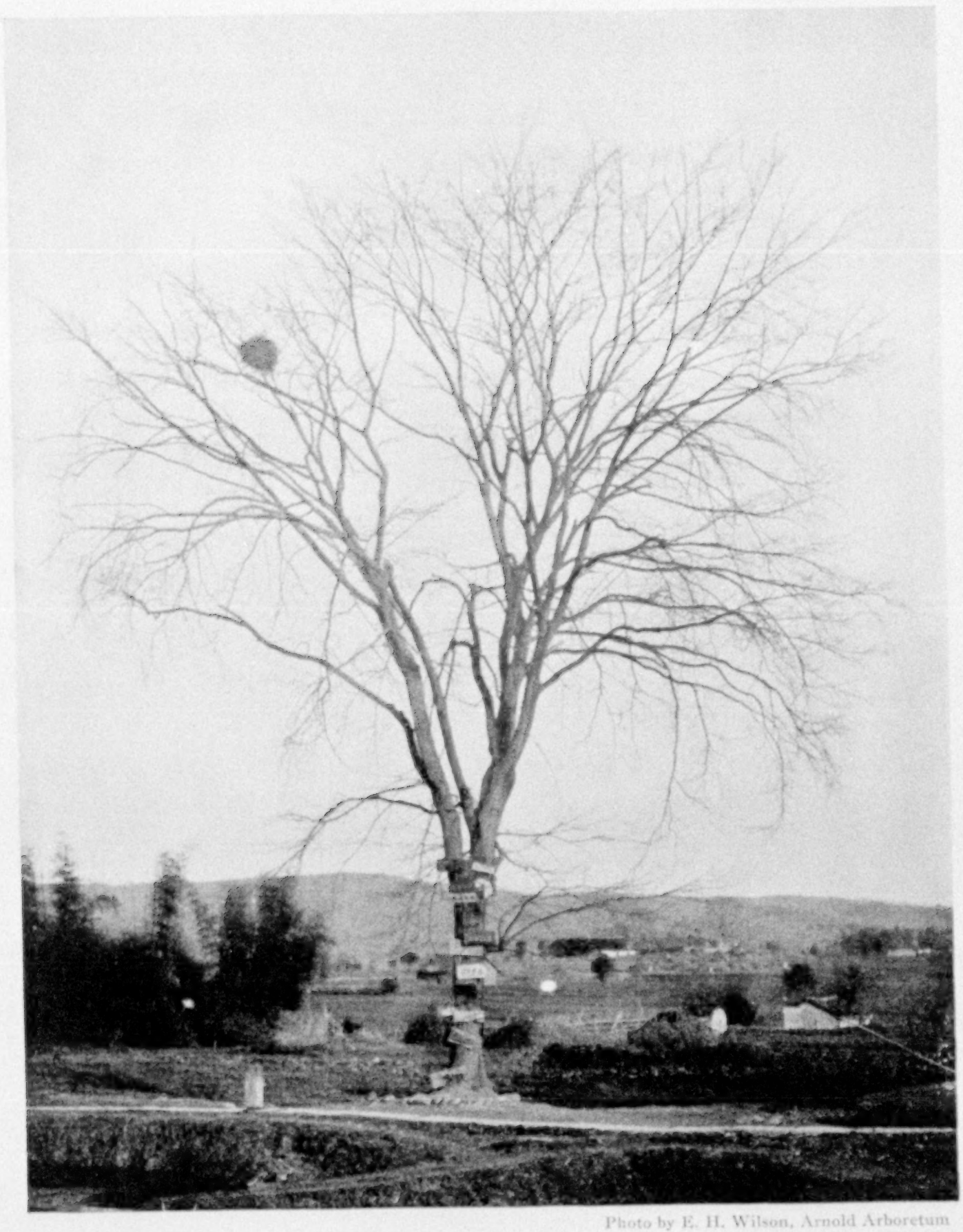


Photo by E. H. Wilson, Arnold Arboretum

GLEDITSIA: TREE 50 FEET BY 6 FEET, NEUTER FORM: ICHANG, WESTERN HUPEH

It is a relative of our common honey locust. The boards are votive offerings to the healing spirit that is supposed to dwell in the tree

west of the Empire, pine (*P. Massoniana*), China fir (*Cunninghamia sinensis*), cypress (*Cupressus funebris*), nan-mu (*Machilus nanmu* and allied species) (see page 1015), wintergreen (*Xylosma racemosum*) (see page 1008), banyan (*Ficus infectoria*) (see page 1014), and a few other kinds of trees are always present. Many of these trees are extremely rare, except in the precincts of these religious sanctuaries.

The most noteworthy example of this is the maiden-hair tree (*Ginkgo biloba*). This strikingly beautiful tree is associated with temples, shrines, courtyards of palaces, and mansions of the wealthy throughout the length and breadth of China, and also in parts of Japan. But it is nowhere truly wild, being a relic of a very ancient flora. Geological evidence shows that it is the last survivor of an ancient family, which flourished during Secondary times, and can even be traced back to the Primary rocks. In Mesozoic times this family played an important part in the arborescent flora of north-temperate regions. Fossil remains, almost identical with the present existing species, have been found, not only in this country and Europe, but also in Greenland (see page 1004).

Though today Chinese gardens, nurseries, and temple grounds do not contain anything new in the way of ornamental or economic plants, it was otherwise up to the middle of the last century. Our early knowledge of the Chinese flora was through plants procured from these gardens, notably those around Canton. These plants were brought to Europe by trading vessels, especially those of the East India Company, at the end of the 18th and early in the 19th centuries. Different patrons of horticultural and botanical institutions in England lent assistance, and collectors were despatched to investigate and send home all they possibly could.

By these means our gardens first secured the early varieties of roses, camellias, azaleas, greenhouse primroses, gardenias, moutain pæonies, chrysanthemums, etc. It is true we have developed most of these almost beyond recognition, and the Chinese are acquiring new forms and varieties from us, yet without these early arrivals from Chinese gardens how much poorer our gardens and conservatories would be today!

In those days, though only about a century ago, that part of the world was loosely spoken of as the "Indies," and this geographical blunder is perpetuated in the specific name "indica," given to many of these plants. In the middle of last century many ornamental plants were received from the gardens of Japan. Botanists, assuming in ignorance that these were natives of the country, gave the specific name "japonica" to many plants which subsequent knowledge has conclusively proved to be natives of China and cultivated only in Japan.

The limited knowledge Occidentals have of China and things Chinese has been acquired slowly, painfully so. It is odd that one of the oldest of civilized lands should be almost the last to come within reach of the explorer, surveyor, and naturalist. The exclusive policy of the Chinese has, of course, been mainly responsible for this, but Occidental indifference and ignorance have helped. Good old Ser Marco Polo told the world and our forebears 500 years ago of this land, but it is only within the last 50 years that the world has begun to listen and believe this wonderful traveler of old!

Our knowledge of the marvelous richness of the Chinese flora has been very slowly built up. Travelers, missionaries of all denominations, merchants, consuls, maritime customs officials, and all sorts and conditions of people have added their quota; but, as in geography and other departments of knowledge relating to the Far East, the Roman Catholic priests have done most. The exclusive policy of the Chinese has necessarily increased the difficulties, and all honor is due to the workers in the past.

Robert Fortune, in the forties and fifties of last century, on behalf of the

Photo by E. H. Wilson, Arnold Arboretum

PRIMROSE (*Primula sinensis* Sab.) AT HOME: SAM YU TUNG GLEN, ICHANG:

From China our gardens first secured the early varieties of roses, camellias, azaleas, greenhouse primroses, gardenias, moutan pæonies, chrysanthemums, etc. We have developed most of these plants beyond recognition, and the Chinese are now requiring new forms and varieties from us. Yet without these early arrivals from Chinese gardens our conservatories and gardens would be very poor today.

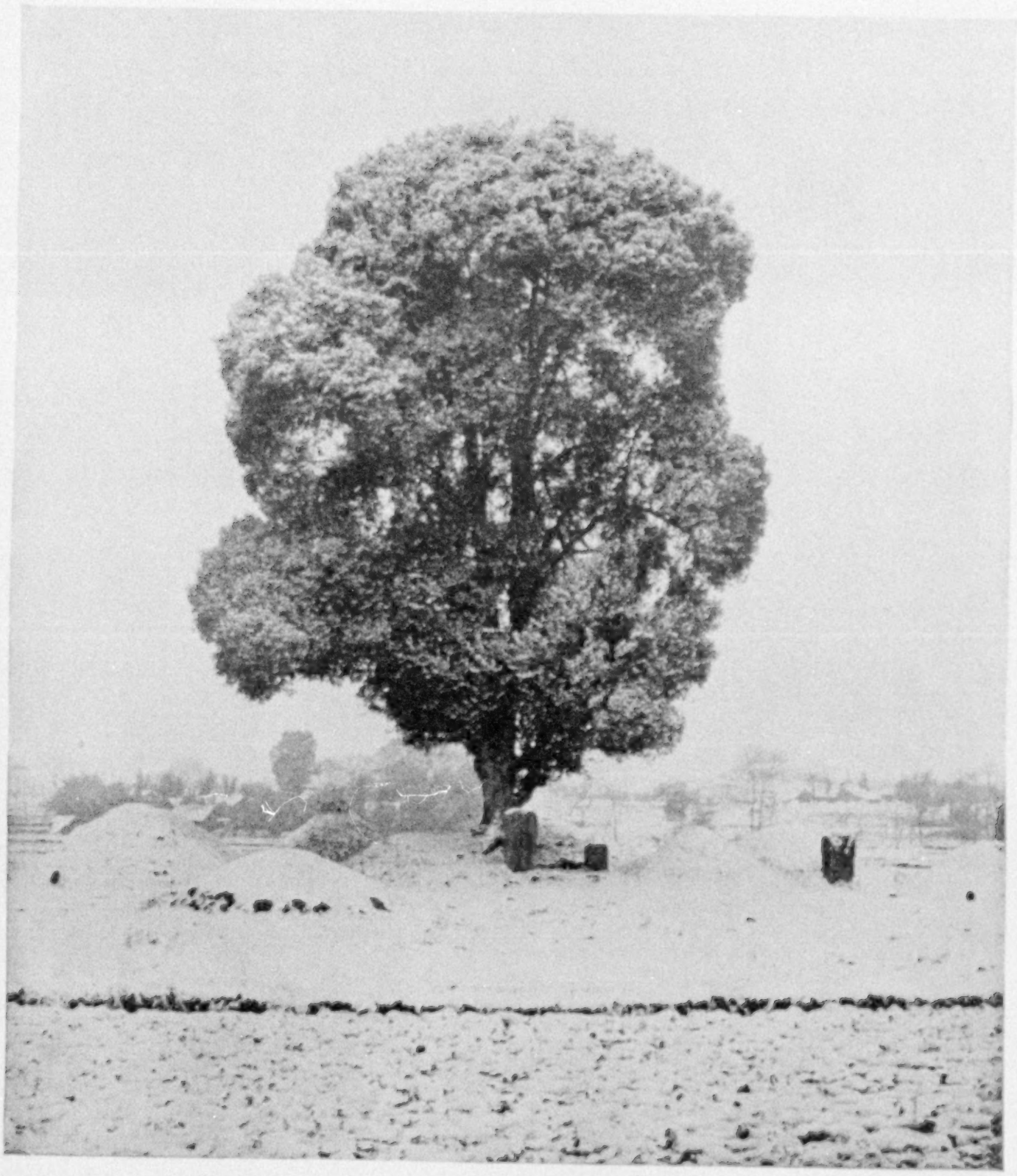


Photo by E. H. Wilson, Arnold Arboretum

A REMARKABLE BROAD-LEAVED EVERGREEN (*Xylosma racemosum* Miq.): TREE 55 FEET BY 6 FEET: PLANTED AMONG THE SNOW-COVERED GRAVES: NEAR ICHANG

China possesses a greater variety of trees than the whole of North America, and of ornamental shrubs has more varieties than are to be found in the temperate flora of all other lands. Many of her ornamental trees and shrubs are suitable for cultivation in the parks and gardens of the United States. The broad-leaved evergreens of China, of which a wonderful example is shown in the above photograph, would add immensely to the beauty of our landscape. It is hoped that several varieties will be found able to thrive in our American climate.

Royal Horticultural Society of London and others, completed the work of his predecessors and exhausted the gardens of China to our lasting benefit; but the difficulties of travel were such that he had practically no opportunity to investigate the natural wild flora. With the exception of perhaps half a dozen plants, everything he sent home came from gardens. But one of his wildlings—*Rhododendron Fortunei*, to wit—has proved of inestimable value to rhododendron breeders across the water.

Charles Maries, collecting on behalf of the London house of Veitch, in 1879, ascended the Yang-tse as far as Ichang. He found the natives there were unfriendly, and, after staying a week, during which time he secured *Primula obconica*, one of the most valuable plants of today, felt compelled to return. Near Kiukiang he secured *Hamamelis mollis*, *Loropetalum chinense*, and a few other plants of less value, and then hied himself away to Japan.

For some curious reason or other he concluded that Robert Fortune had exhausted China, and, most extraordinary of all, his conclusions were accepted! When at Ichang, had he gone some three days' journey north, south, or west he would have secured a haul of new plants such as the botanical and horticultural world had never dreamed could possibly exist anywhere on this planet. By the irony of fate it was left for two or three others to discover and accomplish, at a later date, what was almost within his grasp.

The enormous population, especially in the vicinity of the Lower Yang-tse and its vast alluvial delta and plains, no doubt misled Charles Maries, as it has done others. So densely is China populated that every bit of suitable land has been developed under agriculture. A Chinese is calculated to get more returns from a given piece of land than the most expert agriculturalist in any other country. Dry farming and intensive cultivation, though unknown to them under these terms, have been practiced by Chinese from time immemorial. The land is never idle; they are always tilling and manuring the soil. Nevertheless, in spite of their almost incredible industry, much of the land in the wild mountain fastnesses of central and western China defies agricultural skill, and in these regions a surprisingly rich and varied flora obtains. These parts are very sparsely populated, difficult of access, and, until comparatively recently, totally unknown to the outside world.

The botanical collections of Fathers David and Delavay, and of Augustine Henry, of the Maritime Customs, gave the first true insight into the extraordinary richness of the flora of central and western China. Delavay's collection alone totaled about 3,000 species, and Henry's almost if not quite equalled it! Botanists were simply astounded by the wealth of new species and new genera in these collections. A completely new light was thrown on many problems, and the headquarters of several genera—for example, Rhododendron, Lilium, Primula, Pyrus, Rubus, Rosa, Vitis, etc.—heretofore attributed elsewhere, was shown to be China.

SOME OF CHINA'S BROAD-LEAVED EVERGREENS ARE MUCH DESIRED FOR AMERICA

There is a greater variety of trees, for example, in China than in the whole of North America. In the matter of ornamental shrubs, it is China first and the temperate floras of other lands nowhere!

The flora of China is, generally speaking, a temperate flora, and its great interest and value lies in the fact that it is rich in ornamental trees and shrubs eminently suitable for outdoor cultivation in parks and gardens of this country and Europe. Though a few will withstand our bleakest and severest climate and many are suitable to the climate of our warmer States, the majority find themselves at home in New England, where the climate is no more severe than in Massachusetts. As far as deciduous trees and shrubs are concerned, our hot

Photo by E. H. Wilson, Arnold Arboretum

(*Paulownia imperialis* S. and Z.): TREE 50 FEET BY 5 FEET, IN FLOWER: CHIU TING SHAN, WESTERN SZECHUAN

The beautiful lavender flowers make it a showy ornamental tree for parks

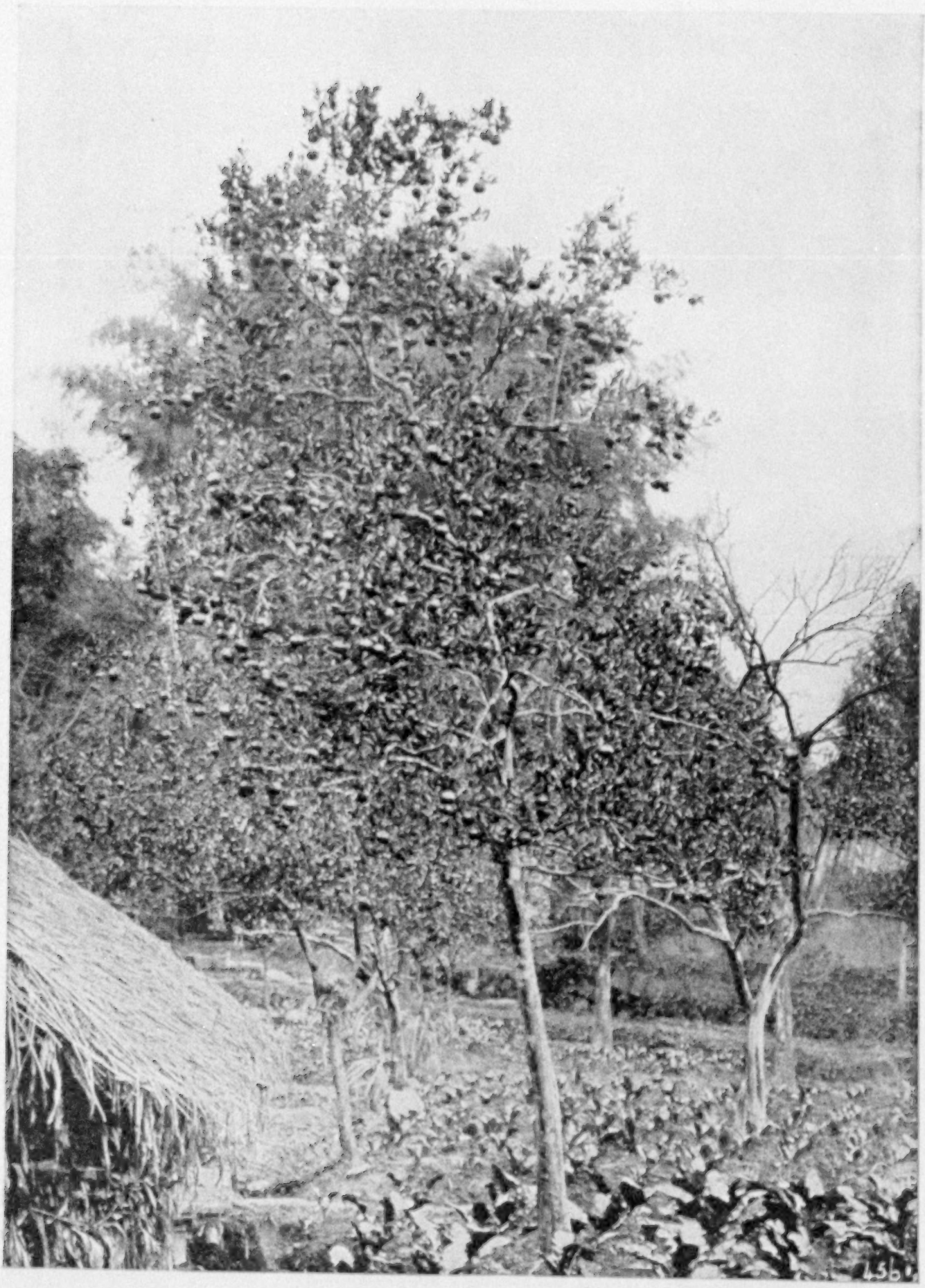


Photo by E. H. Wilson, Arnold Arboretum

MANDARIN ORANGE (*Citrus aurantium* Linn.): TREE 15 FEET, LADEN WITH RIPE FRUIT: BANKS OF YANG-TSE RIVER

To China we owe the parents of our oranges, lemons, grapefruit, citrons, peaches, apricots, European walnut, and other valued fruits

Photo by E. H. Wilson, Arnold Arboretum

THE AUTHOR'S CARAVAN, WHICH CROSSED FROM KUAN HSIEN TO TACHIEN LU VIA THE TRIBES' COUNTRY, A DISTANCE OF APPROXIMATELY 330 MILES

"Dr. Sargent's enterprise has resulted in the acquisition from China of some thousands of seedlings, covering about 1,200 species of plants new to cultivation. These embrace ornamental trees and shrubs, evergreen and deciduous in character; new lilies, iris, pæonies, and other striking herbs; new conifers of probable value as timber trees for afforestation work, and many economic plants valuable to the plant-breeder as a source of new races of fruits, more especially berries."

sun and fine autumns render it possible for us to obtain better results than across the water in England. With broad-leaved evergreens, on the other hand, the advantage is enormously with English gardens. Our hot sun in March and early April and drought in summer are too much for these evergreens. Though in the northern Atlantic States we are rich in deciduous trees and shrubs, our poverty in broad-leaved evergreens is most marked. If China can only give us half a dozen of these much-desired, hardy evergreens, what a gift it will be! There are reasons for being hopeful, if not sanguine.

DR. SARGENT'S SPLENDID CONTRIBUTIONS

One of the very first to appreciate the wealth of China in trees and shrubs was Dr. Charles Sprague Sargent, director of the Arnold Arboretum, of Harvard University. This famous dendrologist has, during his lifetime and by his own efforts, got together in the Arnold Arboretum a collection of trees and shrubs far in advance of anything else on this continent, and, indeed, second to none extant. He quickly realized the enormous possibilities opened up in China, and set about to find means of acquiring as many of these new and desirable plants as possible. A man of fixed purpose, his efforts, once bent in this direction, never relaxed, and today tangible results in the shape of thousands of seedling plants are to be seen in the nurseries of the arboretum. Dr. Sargent received his first collection from China, in 1881-1882, from Dr. Bretschneider, of the Russian Legation, Peking. This collection, though small, contained many plants of striking value, and one and all proved hardy in the arboretum. In the early nineties Dr. Sargent himself visited Japan and North China and collected many seeds of plants for the arboretum. Various small collections have since reached the arboretum, notably one made by Professor Jack, in Corea.

The writer's exploration work in China began early in 1899, and was in the interest of the famous London nurserymen, Messrs. Veitch, of Chelsea. Dr. Sargent was largely instrumental in starting this expedition, and in 1906, when Messrs. Veitch gave up the work, my services were secured on behalf of the Arboretum.

Dr. Sargent's enterprise has resulted in the acquisition of some thousands of seedlings, covering about 1,200 species of plants new to cultivation. These embrace ornamental trees and shrubs, evergreen and deciduous in character; new lilies, iris, pæonies, and other striking herbs; new conifers of probable value as timber trees for afforestration work, and many economic plants valuable to the plant-breeder as a source of new races of fruits, more especially berries. These new introductions include not only new forms of genera already known to us in this country and Europe, but also several entirely new genera.

For the purpose of study, a large collection of dried specimens, covering some 50,000 or more sheets, has been made, and will later find homes in the various national Herbaria of the world. The work accomplished has therefore not only a national, but an international value. In addition to the above, a large collection (over a thousand) of photographs has been made. These photographs (a few of them are here reproduced to illustrate this article) represent many of the interesting trees of central and western China, and give the first real idea of the scenery and general features of that part of China. To students of plant ecology they are of immense value.

RAZOR-BACKED RIDGES AND DEEP DEFILES

Now, before entering on any detailed account of the flora, a brief general description of the country may be of interest.

Central China consists of an irregular mountain mass broken up into razor-backed ridges and deep defiles, with the main watersheds running more or less east and west. These ridges average 5,000 to 7,000 feet and rise to 10,000 feet in their highest points. North and south of Ichang the country is broken up

Photo by E. H. Wilson, Arnold Arboretum

AN IMMENSE *Ficus infectoria* Roxb.: WAN HSIEN, YANG-TSE RIVER

The tree trunk is 50 feet high by 15 feet thick; head 90 feet through. This tree belongs to the great fig family, to which the Banyan tree and the common rubber plant of our houses belong. We have no American tree like it

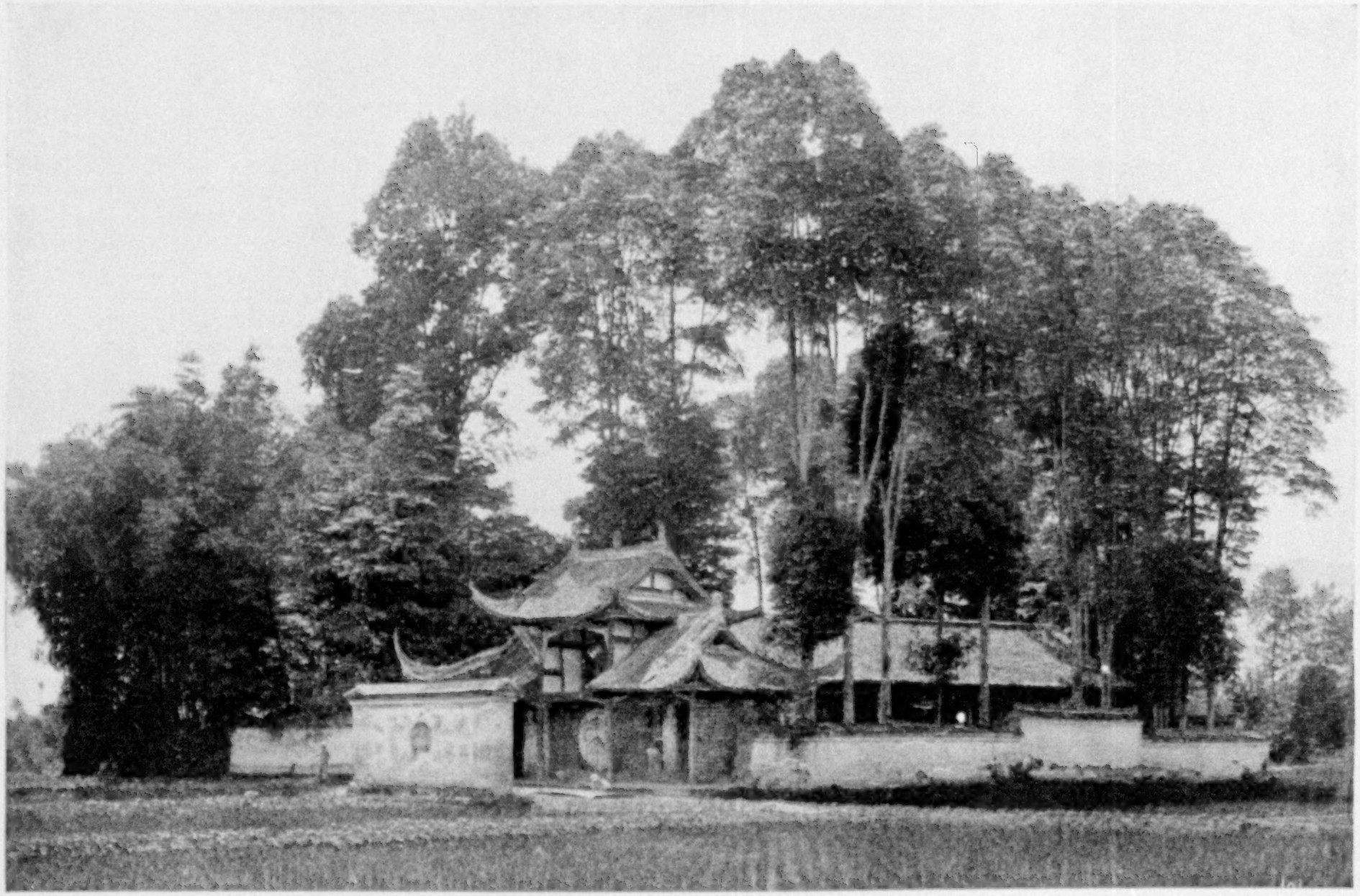


Photo by E. H. Wilson, Arnold Arboretum

TEMPLE, WITH BAMBOO (ON THE LEFT) AND NANMU TREES (*Machilus nanmu* Hemsl.): KUAN HSIEN, WESTERN SZECHUAN: 2,700 FEET

The Nanmu tree furnishes one of the most valuable woods in China, used for temples and coffins. The Chinese have a strong appreciation of natural beauty, choosing the best sites for their temples and shrines, which are always adorned with rare and noble trees.

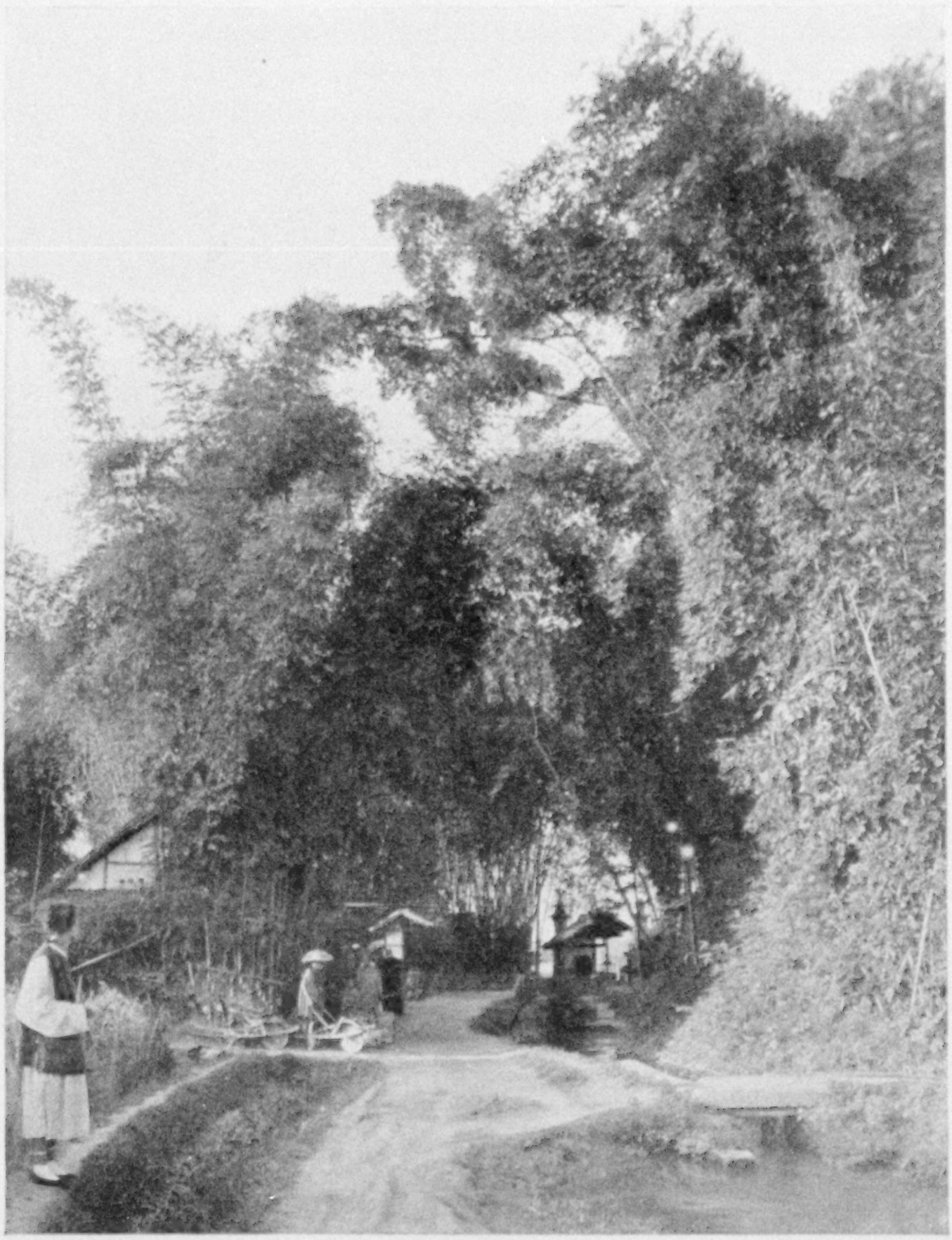


Photo by E. H. Wilson, Arnold Arboretum

"A BIT OF THE MAIN ROAD"; BAMBOO GROVE AND SHRINE IN DISTANCE, NEAR CHENTU CITY

in the wildest manner imaginable. West of this town the world-famous gorges of the Yang-tse River extend for 140 miles.

This mighty river has cut its way through mountain spurs running at right angles to its course and produced gorges presenting wondrous and awe-inspiring scenery. The cliffs are mostly of hard limestone, often a thousand or more feet sheer, with their summits worn into crenulated and castellated peaks, of the most grotesque form and shape. Through these mighty gorges, narrowed to a quarter of its usual width, with a summer rise of a hundred or more feet, its course broken here and there by rapids of alarmingly dangerous nature, the mighty river rushes. At times no craft can stem its currents, and at all times navigation through these gorges is exciting and dangerous.

DOES CHINA CONTAIN MOUNTAINS HIGHER THAN MT. EVEREST?

The far west of China and the Chino-Thibetan hinterland is even wilder than in the central parts, but the watersheds run north and south. These wild, razor-backed ranges, separated by narrow valleys and deep defiles—across which it is frequently possible to converse with a person, though to reach him would take a day's march—ultimately culminate in vast peaks crowned with perpetual snows. These "eternal snows" are mostly uncharted and unmeasured, and can only be compared with those of the Indian Himalayas. It is the writer's firm conviction that when this *terra incognita* is properly surveyed, peaks will be found rivaling in height even Mount Everest itself. The whole region may well be considered, both geographically and ethnologically, as a northern and eastern extension of the mighty Himalayan chain. For savage grandeur and wild, enchanting scenery it is comparable only with the Indian Alps.

This is a region where narrow bridle tracks, often excavated by blasting along the face of cliffs, do duty for highways. Nothing on wheels traverses this region, and, though mules and ponies are used sparingly here and there, the Chinese coolie is the pack-animal and beast of burden. These roadways always follow the courses of rivers and torrents and in the summer floods are constantly being destroyed. Landslides are of very common occurrence and add considerably to the danger and difficulty of travel. The writer has cause to remember these landslides. After being an eyewitness of many accidents, his turn came to be actually involved in one. He had a marvelous escape from death, but sustained a compound fracture of the right leg, which has rendered him lame for life.

The wild character of the country and absence of supplies render travel slow and exceedingly difficult. Yet the botanist and others must be thankful that the country is so savagely wild and impossible of cultivation, or the Chinese would have destroyed all the natural flora to make room for crops. Even as it is, the making of charcoal and potash salts is a severe tax upon forests, even in most remote and inaccessible regions. Wherever it is possible to get timber down to the streams the forests have been almost utterly depleted.

Through ignorance and lack of control China has bankrupted her forests, to the detriment of her climate and consequent fertility of her soil. The deplorable state of things, due to neglect and wanton waste of forests, obtaining in China should serve as a grave warning to other countries and particularly to our own.

MILES AND MILES OF GORGEOUS RHODODENDRONS

In such wild mountain country, affording such variety in climate and blessed with a good rainfall, a rich and varied flora is to be expected. This, as indicated earlier in this article, is what is found, and the richness surpasses that of any other temperate region in the world. In the southern latitudes, near the seacoast and in the river valleys, a warm-temperate flora obtains. Above this, up to an altitude of 3,000 to 5,000 feet, according to latitude, we find rain forests, consisting largely of broad-leaved evergreen trees. Above this again, up to

A TYPICAL LANE IN TARTAR CITY; CHENTU FU, 1,700 FEET

Photo by E. H. Wilson, Arnold Arboretum

Photo by E. H. Wilson, Arnold Arboretum

CLUMP OF GIANT BAMBOOS (*Bambusa vulgaris* Schrad.), 60 FEET HIGH: BANKS OF MIN RIVER, NEAR SUI FU

Photo by E. H. Wilson, Arnold Arboretum

FIELDS OF WHITE OPIUM POPPY (*Papaver somniferum* Linn.): CULTIVATED BANKS OF THE YANG-TSE RIVER, FENGTU HSIEN, WESTERN SZECHUAN

The Chinese have been rigorously enforcing the program enacted by the last international opium conference, which required that the area of opium poppies cultivated in China should be reduced each year

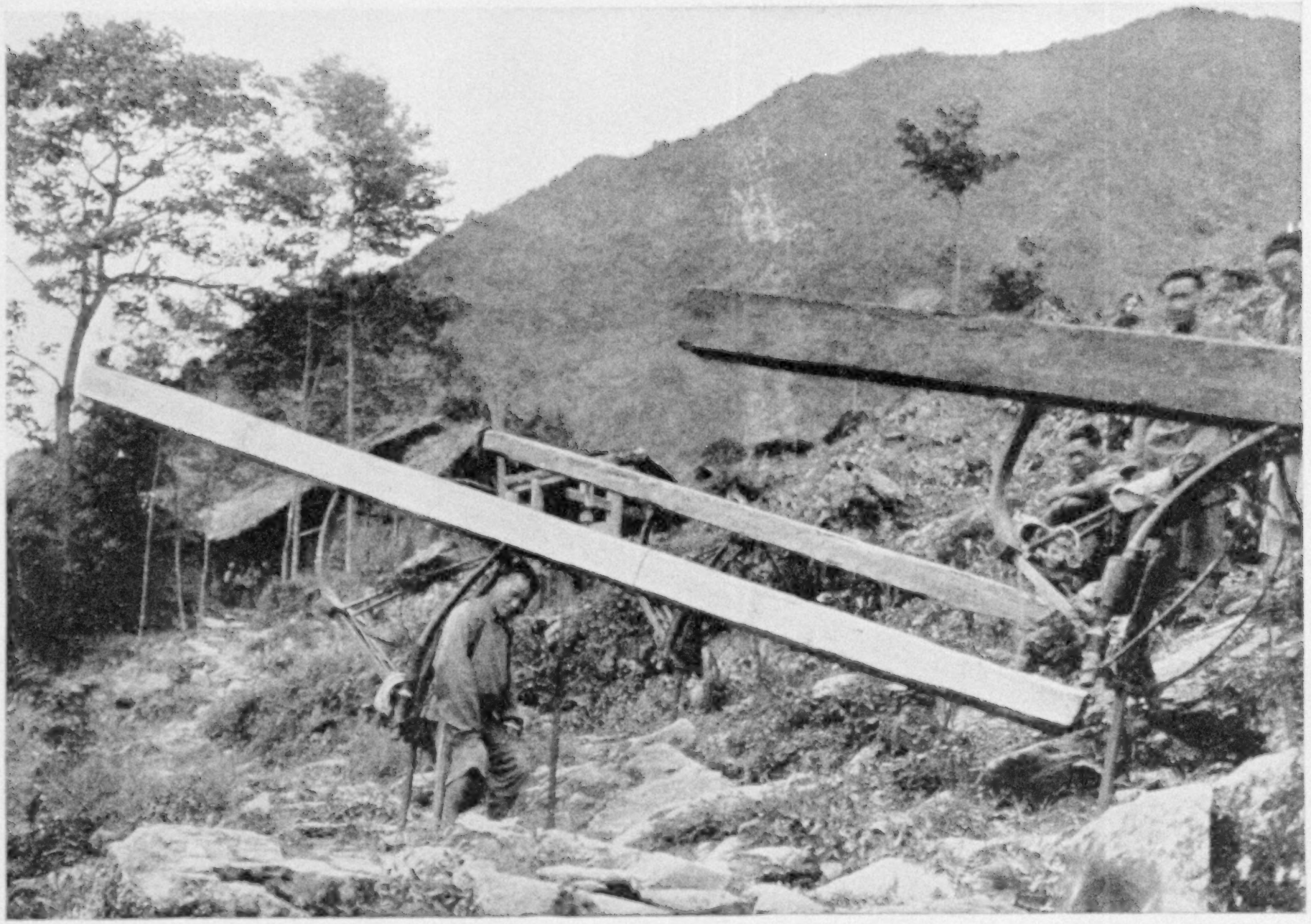


Photo by E. H. Wilson, Arnold Arboretum

A LOG OF *Tsuga yunnanensis* Mast. (A SPECIES OF HEMLOCK), 18 FEET 6 INCHES LONG BY 9 INCHES BY 7 INCHES THICK, CARRIED BY ONE MAN OVER MOUNTAINS

8,000 to 9,000 feet, the forests are composed of ordinary deciduous trees, similar in a general way to those of our own Atlantic seaboard. From 9,000 to 12,000 feet (the general limit of trees) are to be found magnificent forests of spruce, pine, silver fir, larch, and hemlock.

Throughout the conifer forests and extending downwards to 5,000 feet, rhododendrons frequently form the principal undergrowth. In June and early July no more gorgeous sight exists than the miles and miles of these rhododendrons in full flower. Rhododendrons are gregarious in habit and each species has its own well-defined altitudinal range. These characteristics give rise to belts of color—white, pink, scarlet, etc., as the case may be.

Above the tree-limit are undulating moorlands covered with coarse herbs, dwarf rhododendrons, willows, junipers, prickly oaks, etc. These give way to an Alpine vegetation, consisting largely of gentians, primulas, poppy-worts, louse-worts, monkshoods, various composites, etc., all characterized by the intense coloring of their flowers. The limit of vegetation is reached at 16,000 to 16,500 feet. Above this are bare rocks, moraines, and glaciers, culminating in perpetual snows—the whole a panorama of wondrous beauty.

To the general reader it is difficult to convey any adequate idea of the nature of this beautiful flora. Technical names are meaningless to the majority, whose interest does not extend beyond an appreciation of the beautiful. It would be easy to fill a large volume with long names, but such a catalogue would serve no useful purpose here.

OUR DEBT TO CHINA'S GARDENS

In the early part of this article our indebtedness in the past to Chinese gardens for so many plants familiar to all in these days has been lightly touched upon. It may be of general interest to know that China is the real home of, and not merely a place of ancient cultivation of, these and many other plants. In central China the wild parents of our tea and rambler roses, moutan pæonies, chrysanthemums, Boston ivy, Indian azaleas, gardenias, greenhouse and obconica primroses are common plants by the wayside cliffs or woodlands.

Also to China we owe the parents of our oranges, lemons, grapefruit, citrons, peaches, apricots, European walnut, and other valued fruits. These and other fruits are abundantly cultivated by the Chinese, and have been from time immemorial. The origin of our cultivated fruits, vegetables, and cereals is a fascinating though extremely difficult subject. That we owe much to the older nations of the world is beyond dispute, and amongst these China holds a prominent place. That we have not exhausted China's possibilities in this matter I hope to show later.

The Chinese flora is largely peculiar to the country itself, and, indeed, the number of endemic genera and species is remarkable, even when the size of the country is duly considered.

In the south and southwest there is a distinct Malay-Indian element, and in the north several European forms exist; in the far west there is found a distinct affinity with the Sikkim-Himalayan flora. Yet the real affinity of the Chinese flora is with the Atlantic side of the United States!

This remarkable fact was first demonstrated by the late Dr. Asa Gray when investigating the early collections made in Japan. Modern work in China, and especially central China, has given overwhelming evidence and established beyond question Asa Gray's theory. There are many instances in which only two species of a genus are known—one in the eastern United States and the other in China and Japan. Noteworthy examples are the Tulip tree, Kentucky coffee tree, and the Sassafras. In each of these China possesses one species and we have another. A considerable number of families are common to both countries, and in most instances China is the dominant partner. Usually we have one and China several species of the same genus, but here and there the opposite obtains. In a

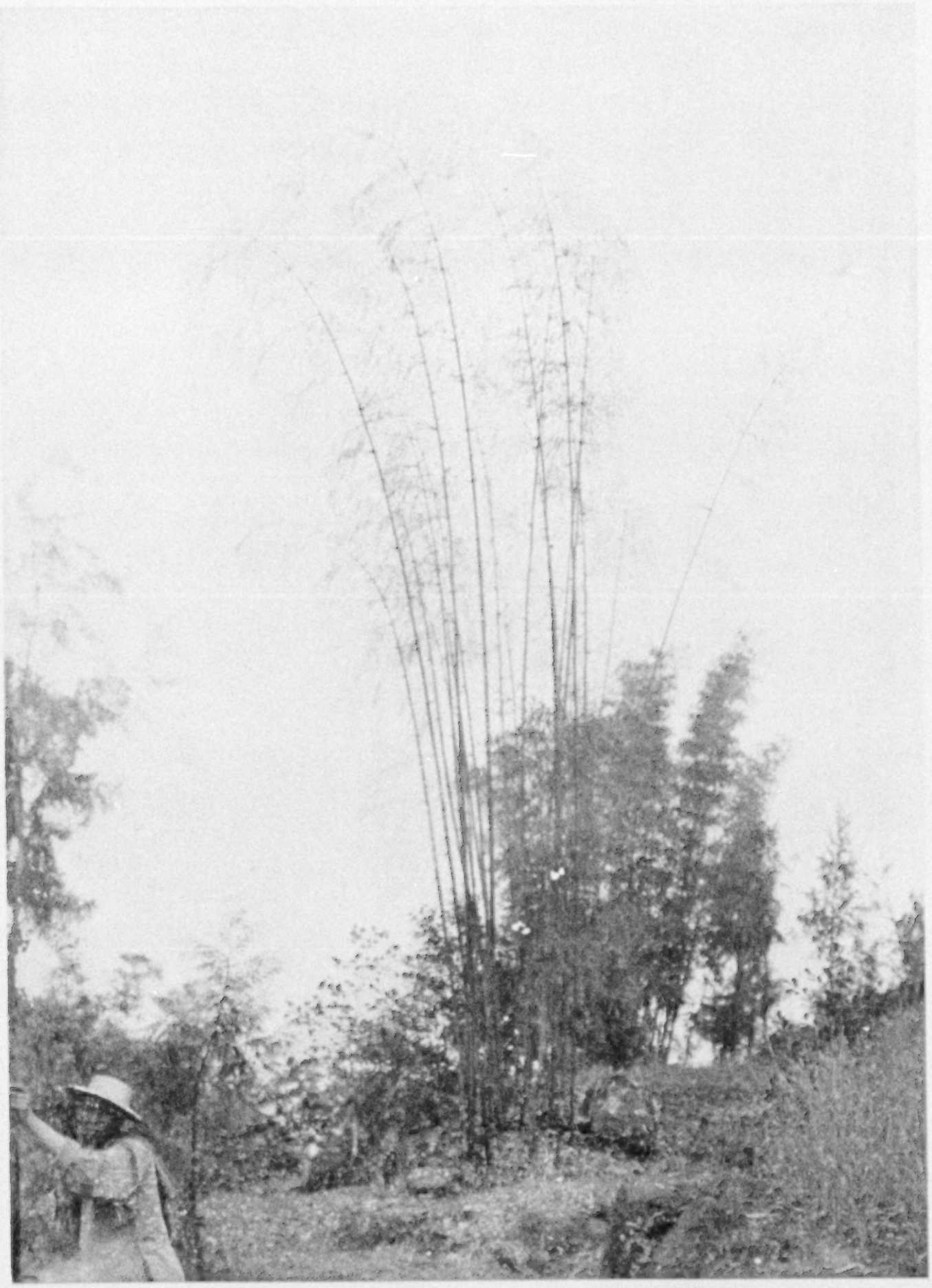


Photo by E. H. Wilson, Arnold Arboretum

Phyllostachys mitis Riv., 20 TO 25 FEET HIGH, IN BUD: NEAR KIATING FU, WESTERN SZECHUAN

The shoots of this bamboo are more highly prized by Chinese and by many Europeans than asparagus shoots

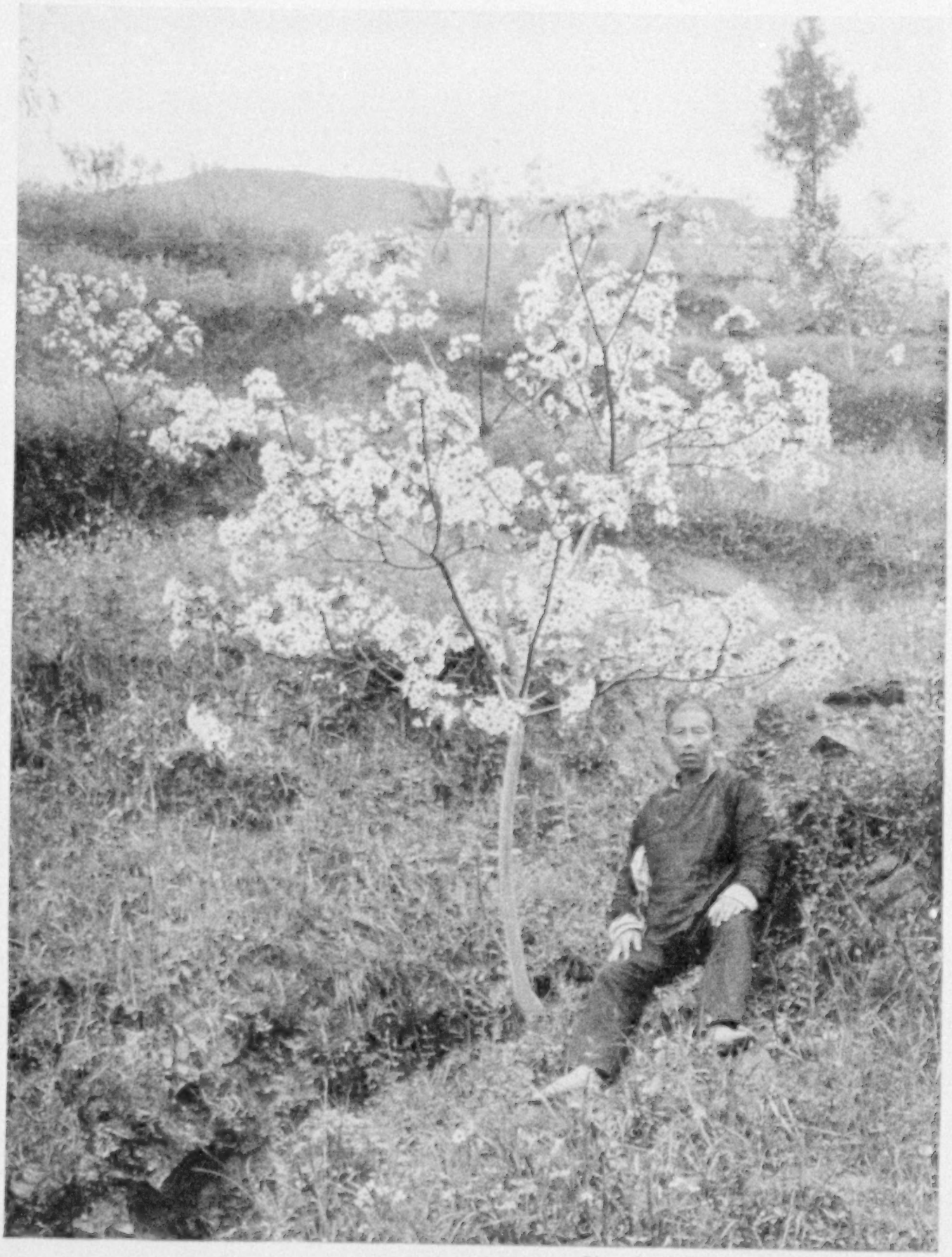


Photo by E. H. Wilson, Arnold Arboretum

Aleurites fordii Hemsl., 10 FEET HIGH: BANKS OF YANG-TSE RIVER, WESTERN SZECHUAN

Flowers nearly white. Much cultivated for oil used for varnishing, which is expressed from seed. The oil expressed from the nuts of this tree is known as tung oil, or wood oil. It is the fastest drying oil known to paint manufacturers, and is imported by the thousand gallons from Hankau. The Department of Agriculture is experimenting with its culture, as the tree grows and bears well in the Southern States (see page 1027).

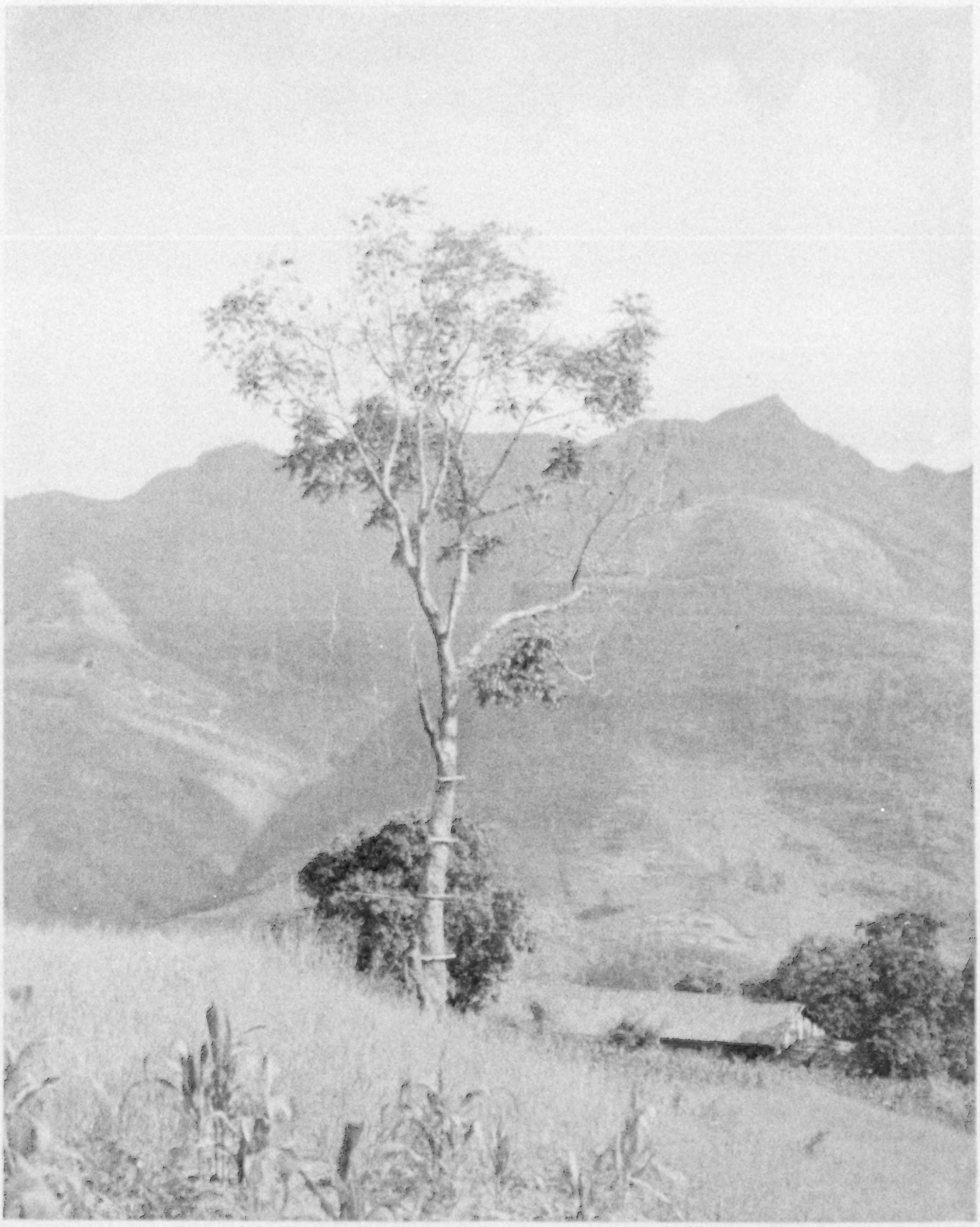


Photo by E. H. Wilson, Arnold Arboretum

A VARNISH TREE (*Rhus vernicifera* DC.), 40 FEET BY 6 FEET: CHING CHI HSIEN, 4,500 FEET

The struts are to enable men to incise the trunk and collect the sap without their feet coming in contact with the acrid, poisonous sap. The remarkable lacquer of China is made from this sap. It is the most indestructible varnish known (see pages 1027–8).

Photo by E. H. Wilson, Arnold Arboretum

"PAI LU," A MEMORIAL ARCH TO THE MEMORY OF A VIRTUOUS WIDOW: A COMMON WAYSIDE FEATURE IN WESTERN CHINA, NEAR KIUNG-CHOU

few instances the same species is common to both countries. The most extraordinary instance of this is *Diphylleia cymosa* (umbrella leaf). This plant occurs in localities separated by 140 degrees of longitude and shows absolutely no marked variation.

In the instances mentioned above, the families are absent from any other region in the world. In others—for example, oak, hornbeam, elm, birch, ash, etc.—where the families range around the whole temperate zone of both old and new worlds, the individual species from China are usually more closely akin to those of North America than to Europe.

The explanation is to be found in the glaciation of the northern hemispheres in prehistoric times. In those far-off times the land connection between Asia and North America was much more complete than it is today, and the flora extended much farther to the north. The ice-cap which gradually crept down forced the flora to recede towards the equator. Later, when the period of great cold was over and the ice-cap receded, the plants crept back; but the ice-cap remained at a more southern latitude than before, and consequently rendered much of the land formerly covered with forests much too cold to support vegetable life of any sort. This rearrangement after the ice age caused a break between the two hemispheres and consequent isolation and cutting off of the floras. Other agencies and factors played a part, but the above explains briefly and roughly why the floras so much alike should, today, be so widely separated geographically.

CHINA CAN STILL HELP US ENORMOUSLY

Since we live in a utilitarian age, in all work the question arises as to its practical use and value to mankind. This botanical exploration work in China has something more than a purely æsthetic and academic value. The beautifying of our homesteads and parks and the additions to our knowledge are not the beginning and end of this work so energetically pursued by the Arnold Arboretum. But as a scientific establishment, devoted to the study of woody plants, its work, after classifying, naming, cultivating, and demonstrating the hardiness and value of new introductions, ends. It is for others to take up the commercial side of these plants and their economic products. To the nurseryman and plant breeder the potential value of these new introductions may mean millions of dollars in the near future. The possibilities are incalculable.

Our Department of Agriculture at Washington is alive to the possibilities of China as a source of new economic plant products, and has already had an explorer in the northwest of the Empire.

In no other country do economic vegetable products enter so largely into export trade as in China. Take, for example, oil-bearing plants. There are a dozen or more largely cultivated in China, but the demand exceeds the supply. In the matter of drying oil for paint and varnish works, Chinese wood oil is superior to linseed oil. This oil, obtained by crushing the seeds of two kinds of small trees, known as *Aleurites Fordii* and *A. cordata*, is annually exported in increasing quantities. The former species supplies by far the major proportion of wood oil exported. It is abundant in the rocky regions around Ichang and throughout the Yang-tse gorges, thriving on the poorest of soil, where a minimum rainfall of 30 inches falls, withstands drought and a few degrees of frost. When in flower, which occurs before the leaves unfold, it is very handsome, and it never fails to produce a large crop of its green apple-like fruits. There must be parts of this vast country of ours where the wood-oil tree would thrive, and some day it will probably become a great industry with us (see page 1024).

Every one is familiar with the lacquer work of China and Japan. The tree (*Rhus vernicifera*) that produces this

Photo by E. H. Wilson, Arnold Arboretum

MEN LADEN WITH "BRICK TEA" FOR THIBET

One man's load weighs 317 pounds avoirdupois, the other's 298 pounds avoirdupois. Men carry this tea for hundreds of miles, accomplishing about 6 miles per day, over vile roads (see pages 1029 and 1035).

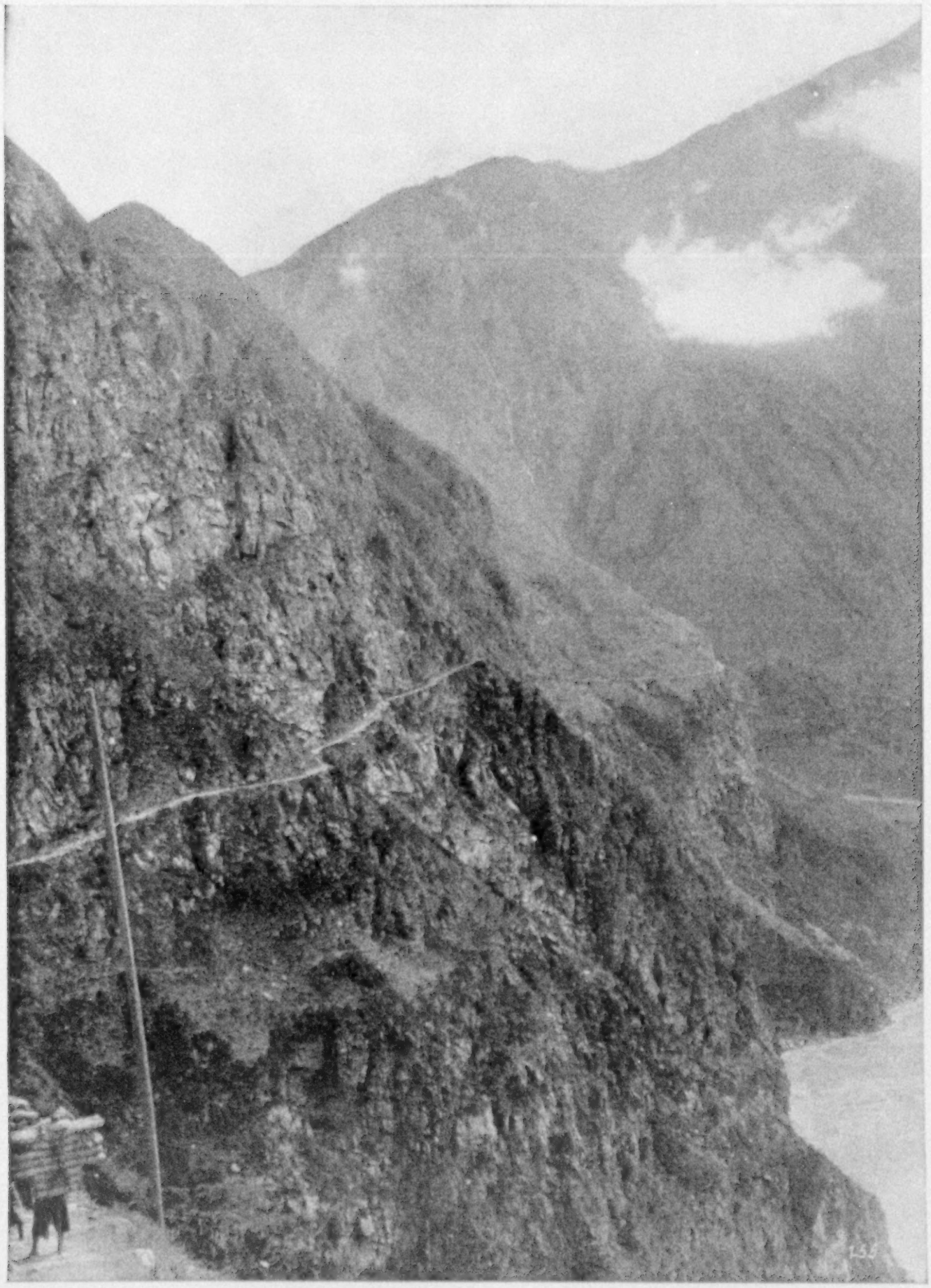


Photo by E. H. Wilson, Arnold Arboretum

MAIN ROAD FROM CHINA TO LHASSA (CAPITAL OF THIBET), HEREABOUTS BLASTED OUT OF HARD ROCKS: VALLEY OF THE TUNG RIVER, 4,000 FEET

Several men laden with "brick tea" appear in the left foreground

lacquer is perfectly hardy and grows freely in the Arnold Arboretum. Why should not the United States of America grow lacquer and develop the industry on modern lines? (see page 1025).

Another species of Rhus (*R. succedanea*) produces a fatty tallow-like substance from its seeds, which is largely used for candle-making in Japan. The seeds of *R. vernicifera*, too, contain an oil which when expressed is used in China as an illuminant and for candle-making. The gall nuts, from *Rhus semialata*, furnish the finest material in the world for tanning purposes. The only hardy rubber tree known is a Chinese tree called *Eucommia ulmoides*. The leaves and bark of this tree are full of a substance akin to caoutchouc. This rubber, though it needs to be separated mechanically and is of low-grade quality, yet from the ease with which the tree can be grown, even in northern Massachusetts, might prove a paying venture. Rubber is a substance to conjure with even in these days, and the future will demand more and more. Synthetic rubber will never be a commercial product, and every living tree yielding rubber should be carefully experimented with. Para rubber will always lead, but this tree requires equatorial regions and conditions, and the area suited to its culture is limited and circumscribed.

Experts from time to time warn the world of an approaching timber famine. Nearly every civilized nation is doing something in the matter of preserving its natural woods and forests and extending them by careful planting and reafforestation. Both hard and soft woods are in increasing demand, and the world's timber bill annually increases enormously.

In addition to many other fine timber trees, there exists throughout the Chino-Thibetan borderland many kinds of valuable pine and spruce trees. Indeed, more species of spruce are to be found in this region than in the rest of the world put together. The majority of these are now in cultivation at the Arnold Arboretum, and their hardiness and suitability to the climate will be thoroughly tested. If they win out, who can appraise their possible value for afforestation purposes in this country? When we realize what a valuable tree the Japanese larch is in Scotland, where it is much more resistant to the canker than European larch, it behooves us to take good stock of these new spruce from China. We cannot have too many valuable timber-producing trees.

Turpentine gets more expensive every year, and the supply falls short of the demand; perhaps one of these new Chinese pines may be useful as an additional source of supply.

Constant efforts are being made to improve and increase our supply of berry-producing plants. In China over 100 species of Rubi are known to exist, and many of these are now in this country. Among these brambles and raspberries are several which, even in a wild state, produce first-class fruits of good flavor. By cultivation they may be much improved, and by cross-breeding may yield berries far in advance of the best today.

In the regions we write of a black currant is found, with berries of good size and flavor borne on racemes a foot and a half long! If it can be crossed with the finer cultivated forms a new race of currants yielding fruits after the manner of grapes may arise. Two or three gooseberries are wild in the woods of China; maybe they will resist the dreaded gooseberry mildew and enable us to cultivate this desirable fruit. The Arnold Arboretum has these berries and many other plants. Who will prove their economic value?

CHINA IS THE ORIGINAL HOME OF THE TEA PLANT

Our work is with woody plants only, but one has merely to mention the soya-bean and its recent development to prove that the world is only just beginning to appreciate China as a source of economic plants and plant products.

All the world knows that China is the original home of the tea-plant industry.

Photo by E. H. Wilson, Arnold Arboretum

TACHIEN LU FROM THE SOUTH: 8,400 FEET

The town was destroyed 100 years ago by a landslip

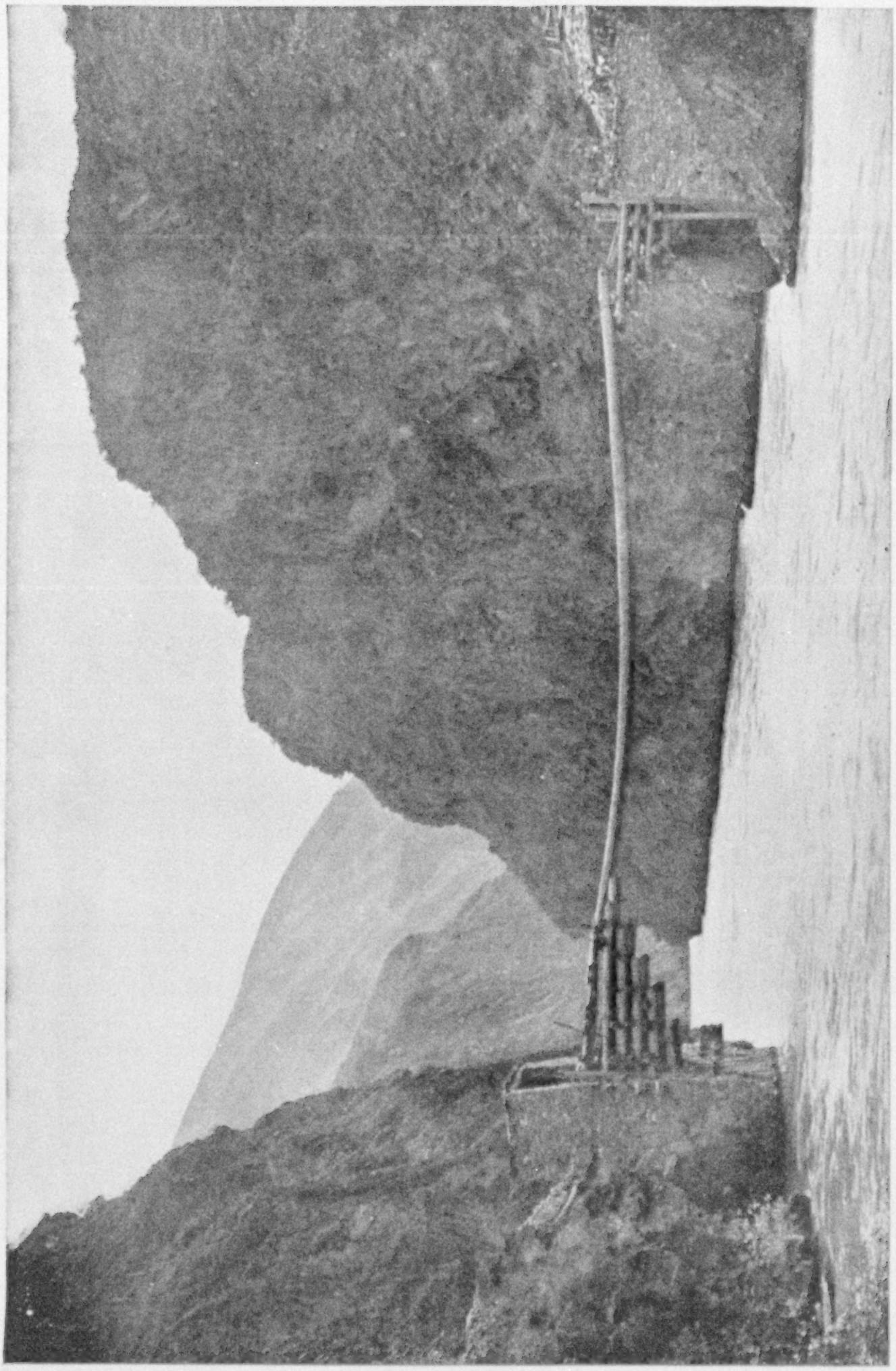


Photo by E. H. Wilson, Arnold Arboretum

BRIDGE OF TWO LOGS, EACH 40 YARDS LONG, ACROSS WHICH THE MAIN ROAD FROM CHINA TO THIBET PASSES: MONKONG TING

Photo by E. H. Wilson, Arnold Arboretum

A FAVORITE CHINESE VEGETABLE, WHICH IN APPEARANCE SOMEWHAT RESEMBLES THE PUMPKIN

The rind exudes a white wax, clearly seen in the picture, which protects the fruit from insects and decay. The technical name is *Benincasa cerifera* Savi. The market gardens at Chentu

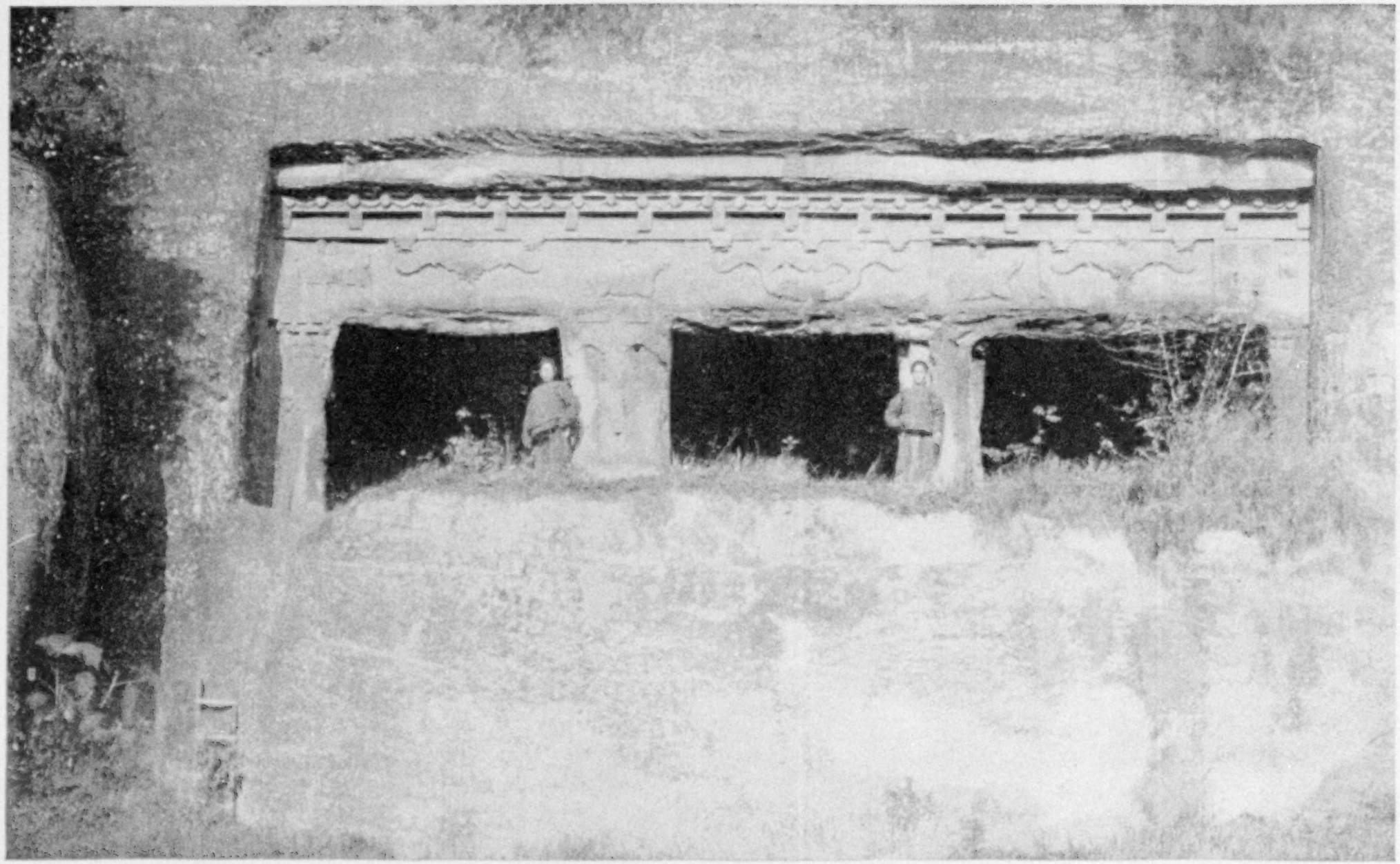


Photo by E. H. Wilson, Arnold Arboretum

A MANTZU CAVE CUT OUT OF A ROCK CLIFF BY A RACE NOW EXTINCT: NOTE THE ORNATE CARVING AROUND THE ENTRANCE; BANKS OF THE MIN RIVER, NEAR SUI FU

Some 60 years ago the industry was introduced on business lines into India and Ceylon, with the result that today these countries supply a greater portion of the world's demand than does China herself. Antiquated methods of cultivation and preparation, absence of co-operation amongst the growers, and heavier taxation are responsible for this decline. It is true that Chinese tea is in quality and delicacy of flavor far ahead of Indian and Ceylon teas, but tea-drinkers generally have acquired a taste for the rougher, dark-colored teas, and China's conservative methods are killing what was once her greatest export industry. Though tea as a beverage is universally drank throughout the length and breadth of the Empire, it is by no means all infused from the leaves of the genuine tea-plant.

In the mountainous parts of central China the peasants hardly ever taste real tea, the leaves of various crab-apples, spiræas, and willow being commonly employed. The writer has drank so-called tea infused from the leaves of a great variety of plants, but bed-rock was reached when chips of wood of a willow tree were on one occasion used. The "infused tea" was decidedly weak and nasty."

To the Thibetans and kindred tribesfolk tea is a necessity of life, and with most of their trade with China this commodity is taken in barter for their wool, skins, gold dust, medicine, etc., and the Chinese carry on an extensive and profitable trade with these people. The tea supplied by China to Thibetans is all grown in western China, and is of the roughest and poorest quality. It is prepared in two distinct ways. For northwestern Tibet and regions around the Koko-nor the plants are stripped of their leaves and the twigs are frequently chopped up and pressed with the leaves into large bales, oval or rectangular in shape, each weighing 90 or 180 pounds.

For the rest of Thibet the leaves are roughly sorted and graded, then steamed, pressed into molds the size and shape of a large brick. These are then wrapped in paper, stamped, and packed in long cylinders made of split bamboo.

This brick tea for Thibet must not be confused with the brick tea made in the foreign factories in Hankow chiefly for the Russian market. The latter is in every way a vastly superior article.

TRIPOLI: A LAND OF LITTLE PROMISE

By Adolf L. Vischer

TILL the beginning of the Turco-Italian war, Tripoli of Barbary was practically unknown to the average man. In fact, apart from the coast, the Turkish vilayet Tarabulus-el-Gharb ranges among the least explored countries of the Dark Continent. The few visitors to Tripoli whom chance had brought to that part of the African shore were all invariably struck by the great charm which lay over it. There at last the lover of the East could find a land unspoiled by railways, manufactories, smoke. There was still an African reservation, and the warden of that reservation was the Turk.

This, however, is now a thing of the past. It is advisable, therefore, that there should be put on record some impressions of the people of Tripoli and of the resources and possibilities of the country, basing the following account on the personal experience that we had the opportunity to gain during a stay in Tripoli last year.

Tripoli is not a geographical unity, but a collection of different countries, which were held together by a common bond—the Turkish rule. Tripolitania, or Tripoli proper, and Fezzan formed together the province or vilayet Tarabulus-el-Gharb, ruled by a governor-general,

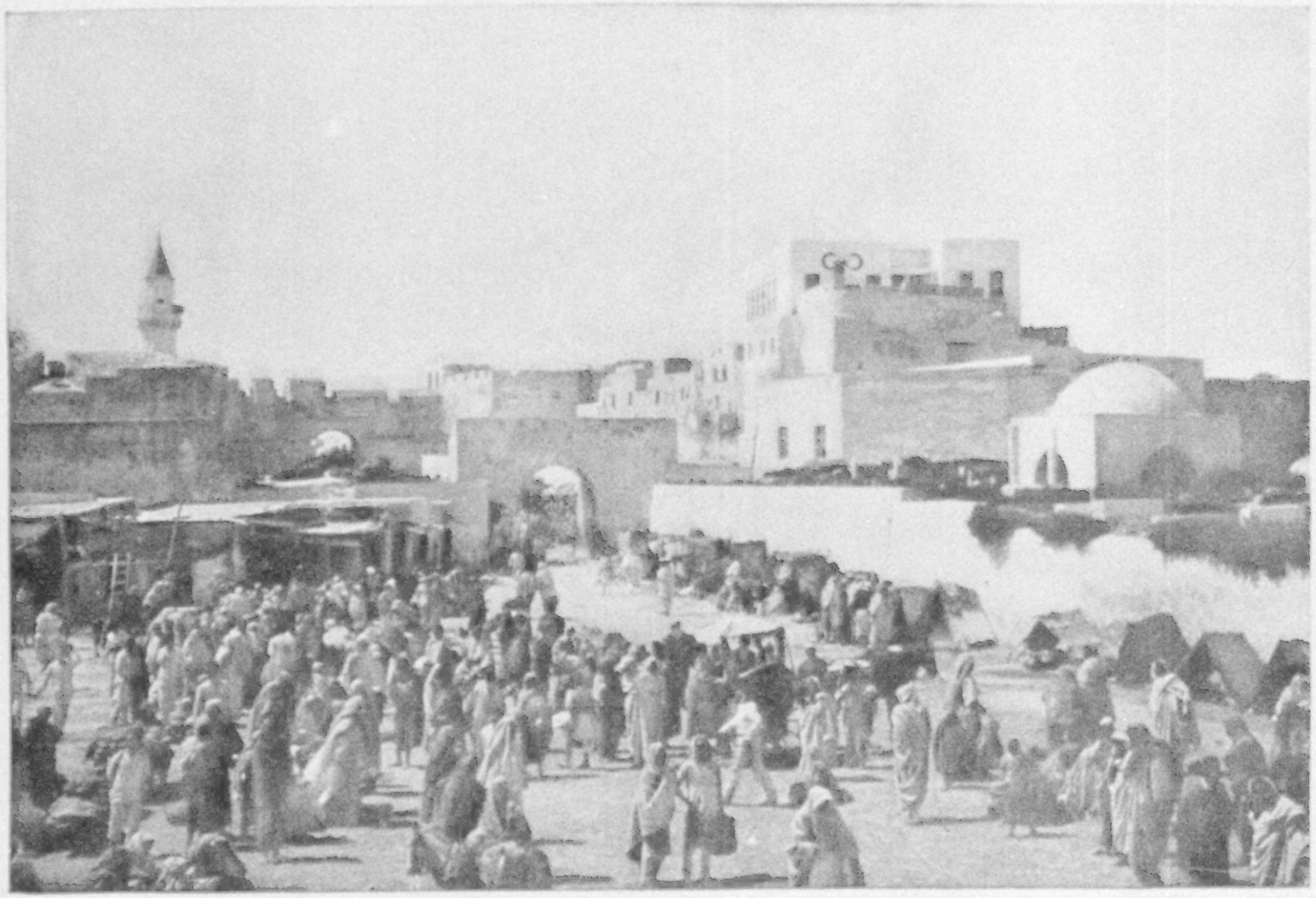


Photo from "The Gateway to the Sahara," by Chas. Wellington Furlong: Scribner's

MARKET OUTSIDE TRIPOLI'S WALLS: CASTLE AND CEMETERY ON THE RIGHT

whose seat is Tripoli town. Cyrenaica was a subprovince with an administration directly responsible to Constantinople.

Let us briefly summarize the geographical features of the country.

Tripolitania occupies the land along the Mediterranean Sea from the Tunisian frontier to the Gulf of Sidra. From the coast southward, with an average width of 40 miles, runs a plain called Jefara. At its southern border rises with a steep ascent a chain of mountains commonly called the Jebel, of which the most famous part is Jebel Gharian. These mountains form a sort of tableland, which slopes slightly southward till it reaches the Hamada-el-Homra, a flat, rocky plateau of about 40,000 square miles, covered with little red stones, absolutely dry and arid. In the south of the Hamada is the land of Fezzan, a collection of oases in a country of dunes and desert. Fezzan forms a wedge of sparsely inhabited land into the great Sahara.

THE HARBORS ARE POOR

Cyrenaica is a projection into the Mediterranean between the gulfs of Sidra and Solum. A section through its center from north to south shows a small plain along the coast; then a steep ascent, which leads to a plateau. This is bounded southward by a second ascent. Behind this a great plain opens, running southward to the Libyan Desert.

It may be added that the frontiers of Tripoli have never been definitely defined, except the part from the seashore to Ghadames, which was settled in 1910 by a Turco-French boundary commission. The undefined frontiers of Fezzan gave rise to many a dispute between the French and the Turks, especially since the Turkish officials of Fezzan developed, in the last few years, a certain activity.

The coast of Tripoli, which extends over a length of 1,100 miles, offers but few natural harbors. The harbor of Tripoli itself is dangerous, because of the many rocks which lie at the entrance, and it was no rare occurrence that in rough weather the steamer could not approach the port. But the harbor is capable of improvement. The ports of Benghazi and Derna are in the same condition.

It is only on the eastern coast of Cyrenaica, which is sometimes called the Marmarica, that we find two harbors of the very best quality: Bomba and Tobruk; but, as both have no hinterland, their value is more strategical than commercial. Tobruk, especially, is highly praised by all visitors, and the German explorer Schweinfurth places it, as regards security, on the same level as the famous French port of Bizerta, in Tunis. Tobruk is less than a hundred miles distant from the Egyptian frontier, and it is not unlikely that it will play in the future an important rôle in Mediterranean politics.

THE INHABITANTS

What is the population now inhabiting Tripolitania, that immense area of 400,000 square miles? No exact census exists, but all competent observers agree that it hardly exceeds 800,000. That means about two inhabitants to the square mile. The sessile or settled population inhabits an area of about 19,000 square miles; that means, roughly, the twenty-first part of the whole land.

A recent writer, Mr. Ewald Banse, estimates the number of the inhabitants of Tripoli proper (the Jefara plain and the Jebel region) as 350,000, of Fezzan as 40,000, and of Cyrenaica as 150,000. The population of the city of Tripoli consists of about 50,000 inhabitants. Of these, 10,000 are Jews, 35,000 Berbers and Arabs, and the rest consists of Maltese, Levantines, Italians, and other Europeans. The number of genuine Italians, excluding the Levantine and Jewish protégé of the Italian consulate, hardly exceeds 200.

The Italians and Maltese are petty traders, artisans, and fishermen. The Jews are traders and artisans and especially smiths, as in Mohammedan countries smithing is regarded as an ignoble profession. A fair number of Jews live

in the Jebel Gharian. This remote Jewish colony is of very old date. Very likely the immigration of Jews into Tripolitania took place under the Roman rule, about 300 A. D.

The Jews of Gharian live, like their Berber fellow-men, in underground houses, and their underground synagogue at the village of Tegrinna is one of the most interesting buildings in Tripolitania.

We do not need to describe these underground houses, as they differ but little from the underground houses in Tunis, so masterly described by Mr. F. E. Johnson in the September number of the NATIONAL GEOGRAPHIC MAGAZINE.

Some confusion prevails as to the difference between Arabs and Berbers. In Tripoli every native calls himself with pride an Arab. As a matter of fact, a certain number of Arabs came into the country with the Mohammedan conquest of North Africa in the sixth century A. D. But the peninsula of Arabia was never so densely populated that it could send away many emigrants. The Arabs conquered North Africa and converted its population to their religion. A few of the conquerors remained in the country, and these are still fairly pure representatives of their race; they live as nomads, or Bedouins, in tents, and move with the seasons from one camping ground to another. Their number is difficult to estimate, as we find them now in the steppes of the Syrt, now in Cyrenaica or Fezzan. Their numbers have, however, been well estimated at about 50,000. A few Arabs, however, have become sedentary and cultivate a little land around Benghazi.

The rest of the population of Tripoli, and that is the sessile part, are Berbers; their blood is mixed with that of Arabs, and also of negroes. The negro element, which we find everywhere in Tripoli, has its origin in the slave traffic of former days, which brought thousands of Sudanese to the coast of the Mediterranean.

In Cyrenaica we find the same kind of population—sessile Berbers and nomad Arabs—but Berbers and Arabs are in Cyrenaica more mixed.

Among the inhabitants of Fezzan are representatives of nearly all North African peoples. In the Wadi Shiati, south of the Hamada el-Homra, there are Arab tribes, while the inhabitants of Sokna and Bonjem are Berbers. Murzuk, that great intermediary station between the Mediterranean and Lake Chad, is a town of easy morals, and its population is a mixture of all the North African races.

MURZUK, IN SOUTH TRIPOLI

Mr. Hanns Vischer, one of the few travelers—they are not more than three—who visited Murzuk in the last 20 years, gives us in his "Across the Sahara" a picture of the life in that town which we should like to quote:

"During the day all Murzuk can be seen in the high street, walking or riding along through the deep sand toward the market at the east end, to which the peasants bring their produce from the gardens to sell to the Turkish officials and the soldiers of the garrison. An occasional trader, too, from Bornu or the Sudan may sell some of his goods before going on toward the coast. Sometimes Tuaregs and Tubbus bring their dates here or put up a camel for sale; and, side by side with sugar, scented wood, and tea, are to be found the glittering gewgaws from Tunis and Tripoli. Glasses, beads, scents, and colored silks, cheap productions of European markets, are there, which give the whole scene a merry coloring and please the Murzuk people, reminding them a little of former days, when the immense caravans from Bornu camped round the town and Tripoli and Benghazi sent thousands of camels through the town each year. . . .

"Around the grass shelters under which the wares were laid out, there was as much life and animation as in any of the great African markets. Hausas, Kanuris, Bagirmis, and Fellata slaves jostled sulky Tubbus; old Murzuk traders who has seen better days passed up and down, full of importance, as if the

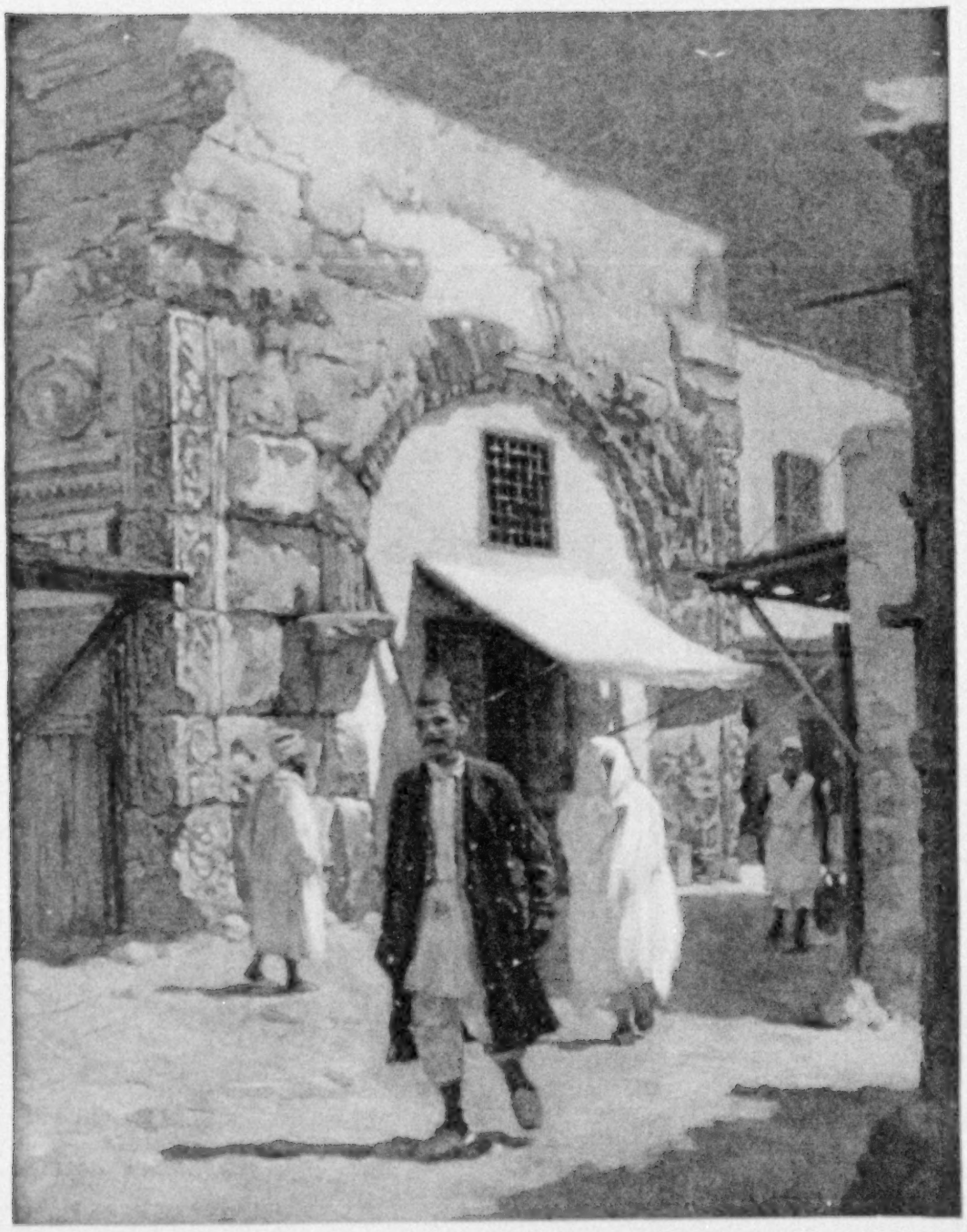
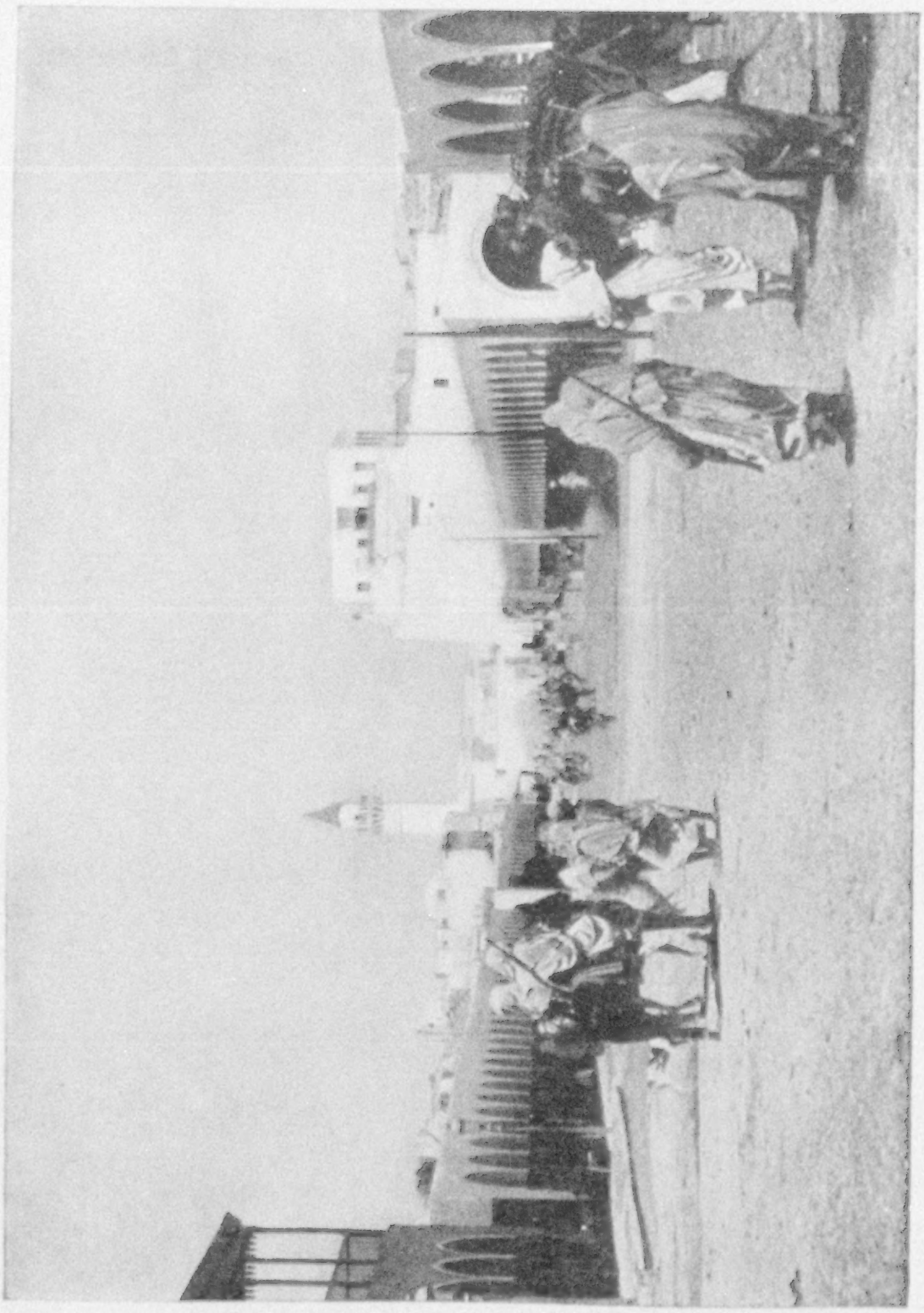


Photo from "The Gateway to the Sahara," by Chas. Wellington Furlong: Scribner's.

"IN THE HEART OF TRIPOLI STANDS . . . THE ARCH OF MARCUS AURELIUS"

"Evidences of the Roman occupation confront one on every hand. Columns of a Pagan Rome support the beautiful domed vaultings of some of the mosques, or are set in as corner posts to the houses at every other turn, and the drums thrown lengthwise and chiselled flat are used as steps or door-sills. Beyond the walls of the town fragments of tessellated pavement laid down two thousand years ago are occasionally found. Two Roman tombs decorated with mural paintings were recently discovered about a mile or so from the city. In the very heart of Tripoli stands what once must have been one of the most splendid triumphal arches of antiquity. It is known to the Moors as the Old Arch; to the Europeans as the Arch of Marcus Aurelius, in whose honor it was erected A. D. 164."



THE END OF THE GREAT CARAVAN ROUTE FROM THE SUDAN AS IT ENTERS TRIPOLI

Photo from "The Gateway to the Sahara," by Chas. Wellington Furlong; Scribner's

traffic depended on them; Arabs from the coast poked their long guns into every one's face as the crowd nervously made way for them. Tuaregs, Turks, Albanians, splendidly grown Turkish soldiers in torn uniforms, all acted their part with the greatest entrain."

At Gatrun, south of Murzuk, the inhabitants show all the characteristics of the Bornu people. As a matter of fact, the Bornu rulers of the Sefiya dynasty in the XIIIth century A. D. included Fezzan in their empire. They founded in that country slave colonies for the working of the Natron mines and for the protection of the caravan trade. The capital of the Bornu empire was Kuka, on Lake Chad. The actual Shehu of Bornu is still the owner of a certain number of date palms in the oasis of Murzuk.

In Tejerri, the most southern inhabited place of Fezzan, we find Tubbu Reshade, representatives of that lawless desert tribe which has its headquarters in the rocky highland of Tibesti. The old castle of Tejerri, which is perhaps of Roman origin, serves to the inhabitants as a refuge in times of invasion by desert brigands.

UNDER THE PROPHET'S GREEN BANNER

Besides these more or less distinct races, there are the dark and not especially characterized Fezzanis. They are probably but a bare 40,000 in number. In about eight inhabited places they fight a hard struggle against the dunes which threaten to invade the few cultivated lands. The products are hardly sufficient to maintain the frugal inhabitants, and this compels many of them to go to the coast towns, to Tripoli and Tunis, and earn a livelihood there as servants or artisans. These have a touching affection for their country, and after some years they return home with the money earned. Cattle-rearing is of small importance in Fezzan. The land has no large pasture grounds, and the Fezzani drives his cattle and sheep to pasture on the steppes of the Syrt.

All these different peoples are united under the green banner of the Prophet, who in our days has his most fervent followers in North Africa. The religious brotherhood of the Senussiya has branches in nearly every town and village. Its meeting-places, or Sawyas, are convent, mosque, school, and hospital in one. The teaching is puritanism and uncomprising hatred of everything that is foreign and infidel.

That, however, does not mean that every follower of the Senussiya is a dangerous enemy of the European; he merely avoids all intercourse with him. Some Europeans have even experienced kindness and hospitality from fervent Senussis. That, of course, was only possible provided they did not offend the Islamic creed or violate Eastern customs. Turks themselves failed repeatedly to get into contact with the leaders of the sect; but a change came not long ago when a political understanding between the Senussis and Stambul became so far a fact that a Senussi mission was dispatched to the Sultan.

The headquarters of the sect are in the Libyan desert, probably in the oasis of Kufra. There is the Sawya-el-Istat, or convent of purity. The headquarters were first at Benghazi, but later, it was said after representations from the European consuls, they were removed further inland. The sect is very strong in Cyrenaica and Fezzan. One of the tenets of Senussism has had some slight effect on commerce, viz., that of tea-drinking. The old sheik of the Senussi, seeing the gradual spreading of alcohol among the North African Mohammedans, advocated the substitution of tea, and since then the drinking of very strong tea, to which a large quantity of sugar has been added, has become quite a mania, which cannot fail to damage the nervous system of the people.

The chief industries of Tripoli town are leather and metal work; also the esparto-grass business and sponge fishing. Sponge fishing is of considerable importance, but it is almost entirely done by Greeks, who appear once a year with a flotilla in Tripolitan waters, and therefore this industry affects the country

but little. In different places along the coast a certain number of salt pans are exploited by the Turkish government. In Misurata, a town some 100 miles eastward from Tripoli, fine carpets are manufactured, which are sold in the bazaars of the capital.

The home industries of Tripoli were greatly encouraged by the Turkish Technical School which was founded by the late Marshal Redjeb Pasha, who acted for 10 years as governor-general of the vilayet. He was a man of remarkable ability, an excellent administrator, who did more for the welfare of the country than any of his predecessors. In the first Young Turkish administration of 1908 he was appointed Minister of War. He returned to Constantinople, from which he had been so long sundered by the Hamidian policy of keeping the strongest men in the remotest posts. But his new appointment was of short duration, for he died a few weeks after his arrival in Stambul. In an obituary notice the *Times* described him as "one of the ablest men in the Turkish Empire." He had governed Tripoli honorably for many years, and it was said that he left in debt.

On this occasion it may be permissible to mention some other distinguished Turkish officials who struggled for the progress of that forlorn province of the Ottoman Empire under most difficult circumstances, and whose names ought to be remembered by the outside world. Djamy Bey, deputy of Fezzan in the Turkish Parliament, was a man of high education, through whose energetic measures the communications between the coast and the hinterland were greatly improved. By his remarkable description of the Tuareg city of Ghat in the *Geographical Journal* (London, August, 1909) he made himself known in the geographical world. Samy Bey, governor of Fezzan, was a man whose whole life was devoted to the betterment of that poor province. By his able policy he brought the lawless desert tribes under Turkish rule. Under the régime of Abdul Hamid he suffered for the Young Turkish cause as an exile in some remote part of the Empire for 10 years. Mention should also be made of Dr. Reshid Bey, who ruled the province of Homs for the last four years; he also ranges among the class of high-minded and noble men. Certainly not all Turkish officials in Tripolitania have deserved praise, but the names of these men who worked for their country in a spirit of noble and unselfish patriotism ought not to be forgotten.

BARLEY AND ESPARTO GRASS ARE THE PRINCIPAL PRODUCTS

Agriculture and cattle-rearing are the chief resources of Tripoli, but they flourish only in small patches; fertile land we find on a narrow strip along the coast, in the region of Jebel Gharian and in Cyrenaica. The product is barley, which in the last few years has superseded wheat, olives, figs, and vines. Barley is shipped from Cyrenaica, mainly to England, but the crops are subject to great variations. Four years ago barley had to be imported into Benghazi, owing to the complete absence of rain, which caused a failure of the crop in western Cyrenaica. The same is now being experienced in Tripoli, where a famine threatens the population, as there has been scarcity of rain for the last two years.

Some figures may illustrate the amount and also the variation of the barley export: In the year 1903 it amounted to £70,000; in 1904 it was only half that of the previous year, £32,000, and in 1908 the export was practically nil.

Another important product of the soil is esparto grass. Esparto, or Spanish, grass (*Lygeum spartum*) is a grass resembling the ornamental feather grass of gardens. It attains a height of three or four feet. On account of the tenacity of its leaves it has for centuries been employed for the making of ropes, sandals, caskets, and mats. It grows in the steppes and in the Jebel, as in Morocco and Algiers, but is inferior in quality to that of these countries. It is mainly shipped to England, where it is now used

Photo from "The Gateway to the Sahara," by Chas. Wellington Furlong: Scribner's

A BAREFOOTED BAKER MOULDING COARSE DOUGH INTO ROUNDED LOAVES

in the manufacture of paper. It is brought to Tripoli or to Homs (a town on the coast eastward of the capital) by the Bedouins. In these places, which are the centers of this trade, European firms have erected machinery, where the grass is pressed in packs. The esparto-grass export amounted in 1903 to £76,000; in 1904, £126,000.

The dates of Tripolitania are not of a very good quality and they are not in any appreciable quantity exported. Date palms grow along the coast and in Fezzan. At the end of the summer Bedouins of the Jefara go to Fezzan for the crop of dates and take to the Fezzanis in exchange barley and wheat.

More important than agriculture is the cattle-rearing. It flourishes in Cyrenaica, from where cattle, sheep, and goats are exported by ship to Malta and overland to Egypt. There is also a considerable export of camels to Egypt and Syria. The imports to Tripoli consist chiefly of foodstuffs, tea, cotton goods, and sugar.

THE REASONS OF TRIPOLI'S DECLINE

Much has been said in the press and by Italian political writers about the grandiose prospects of the country. These prospects are mainly based upon the supposition that Tripolitania was, under the Roman empire, a province of flourishing agriculture and enormous wealth. There can be no doubt that Tripoli once saw better days, although the accounts of some of the ancient writers seem to be exaggerated. The causes of the decline are manifold and far from clear. The decline commenced

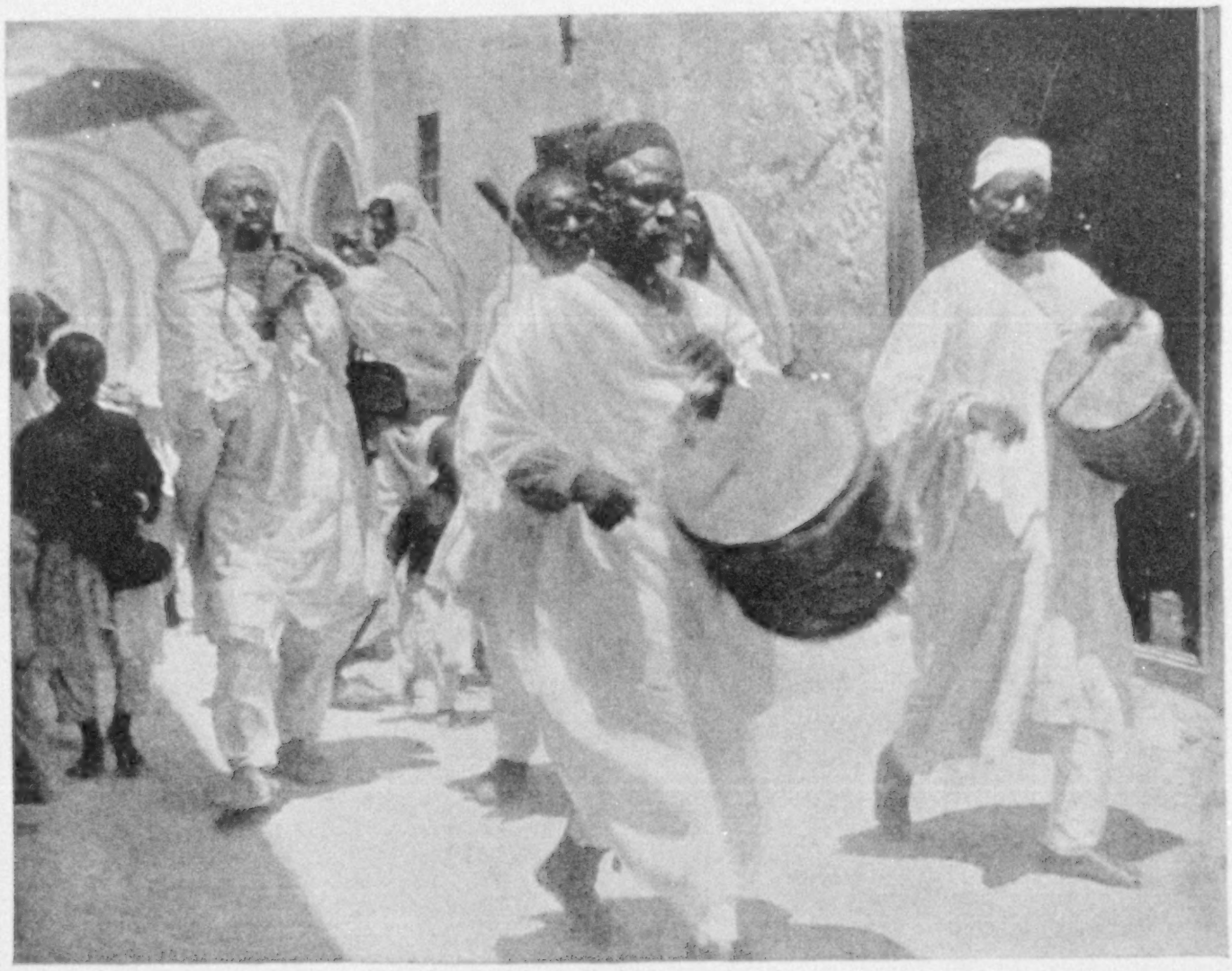


Photo from "The Gateway to the Sahara," by Chas. Wellington Furlong: Scribner's

SUDANESE BLACKS ANNOUNCING A RELIGIOUS DANCE

when Rome's power began to weaken. The wild tribes of the desert, which had been kept down by force, took advantage of Rome's weakness and attacked the boundaries of the colony. The elaborate system of irrigation could only work when there was absolute security. When peace was no longer assured, the agriculturist was hindered in his work.

A second cause of the decline of the country—which is, however, still a point of controversy—is a change in the climatic conditions of the region. There is probably some truth in this assertion. Every man who has seen, in the midst of the desert, the ruins of Roman castles and villas comes to the belief that some mightier power is responsible for such a change.

A great tragedy has been enacted here. Mr. Hanns Vischer gives us a description of what he saw in Gherria, the ruin of a Roman town on the road between Tripoli and Fezzan. "It was a pitiful sight to behold a hungry-looking crowd of fanatics under the ruins of the Roman gateway bearing the inscription, 'Pro. Afr. Ill.' (Provincia Africa Illustris)."

Mr. Pervinquière, the French geologist, who traveled from Tripoli to Ghadames in the spring of this year, says of the country which he traversed: "It is difficult to form an idea of the desolation of the immense solitudes. For days and days we advanced over naked rock. No trace of vegetation. Everything is cleared away by the wind, which rules over these plateaus. . . . The reason for such a sterility has not to be sought in the geological constitution, but in the

atmospheric conditions. It never rains in that land. A local tradition says that the bad behavior of the women of the country prevents the clouds from giving rain. I should not like to give an audacious judgment on the virtue of these ladies, but I must mention that often five, seven, and ten years pass without rain."

Apart from the scarcity of rain, we find in the invading sand dunes another great enemy of agriculture. A great space of the Jefara plain is covered with them, and in their migration they threaten to invade the cultivated patches. Quite near to the palm gardens around the city of Tripoli one can see dunes rising to a height of about 70 feet.

HER FORMER PROSPERITY GREATLY EXAGGERATED

The only scientific investigation of the resources of the soil we owe to a commission sent out to Cyrenaica by the Jewish Territorial Organization to examine the territory proposed for the purpose of a Jewish settlement. Prof. J. W. Gregory, the head of that expedition, came to the conclusion that the general reports of the former wealth, dense population, and exceptional fertility of Cyrenaica have been exaggerated. Although the soil is excellent, it is patchy, and the country is better suited for pastoral than for agricultural occupation. Owing to the scarcity of water, the country could never have supported, and never will support, a dense population. Storage of water presents difficulties, owing to the porosity of the soil.

What Professor Gregory says about Cyrenaica may be true, with some modifications, also, for Tripoli, which never was examined scientifically from that point of view. If it may be permitted to utter a personal opinion here, one would say that the lot of the inhabitants could be improved by bettering the means of communication, and thus enable them to sell more easily the products of their land; by construction of artesian wells and of irrigation works, and by encouraging the home industries by foundation of technical schools, as already started by the Turkish government. But such measures would require comparatively large capital. It is more than doubtful if the land can become the home of a great number of European settlers.

The somewhat sanguine prospects of mineral treasures in the soil are based on no solid grounds. Professor Gregory is absolutely pessimistic about Cyrenaica; the few investigations made in Triopli by some geologists are not encouraging. Mr. Pervinquière, on his journey to Ghadames, found that the deposits of Zar, which some one had described as nitrates, were merely gypsum. Equally unsatisfactory was the examination of samples of phosphates found in the Jebel.

Some 50 years ago Tripoli deserved, with a certain right, the grandiose names of "the Key to Central Africa," or "the Queen of the Sahara." Today these glories are of the past. Once Tripoli was the great emporium of the trans-Saharan trade. Not far from Europe, and by its situation in the Syrt nearer to the heart of Africa, it was the gateway of the trade with Central Africa. Large caravans arrived laden with the goods of the Sudan and the Niger countries. These goods were ostrich feathers, ivory, skins, minerals, and slaves. The slave traffic was the most remunerative article of that trade. In exchange the caravans took south the productions of the European market. Murzuk and Ghadames were then the important intermediary stations, and the trade brought wealth and life to these remote towns.

The decline of the trans-Saharan trade began when the representatives of the European powers protested against slave trade. After these remonstrances the Turks began to stop the slave traffic. Nowadays the slave traffic on the routes between Tripoli and the south can be regarded as extinct. It is said that there is still some slave traffic going on on the Benghazi-Wadai route, but such assertions are difficult to prove, as this traffic is carried on secretly.

Another cause of decline was this:

XUM

Photo from "The Gateway to the Sahara," by Chas. Wellington Furlong: Scribner's

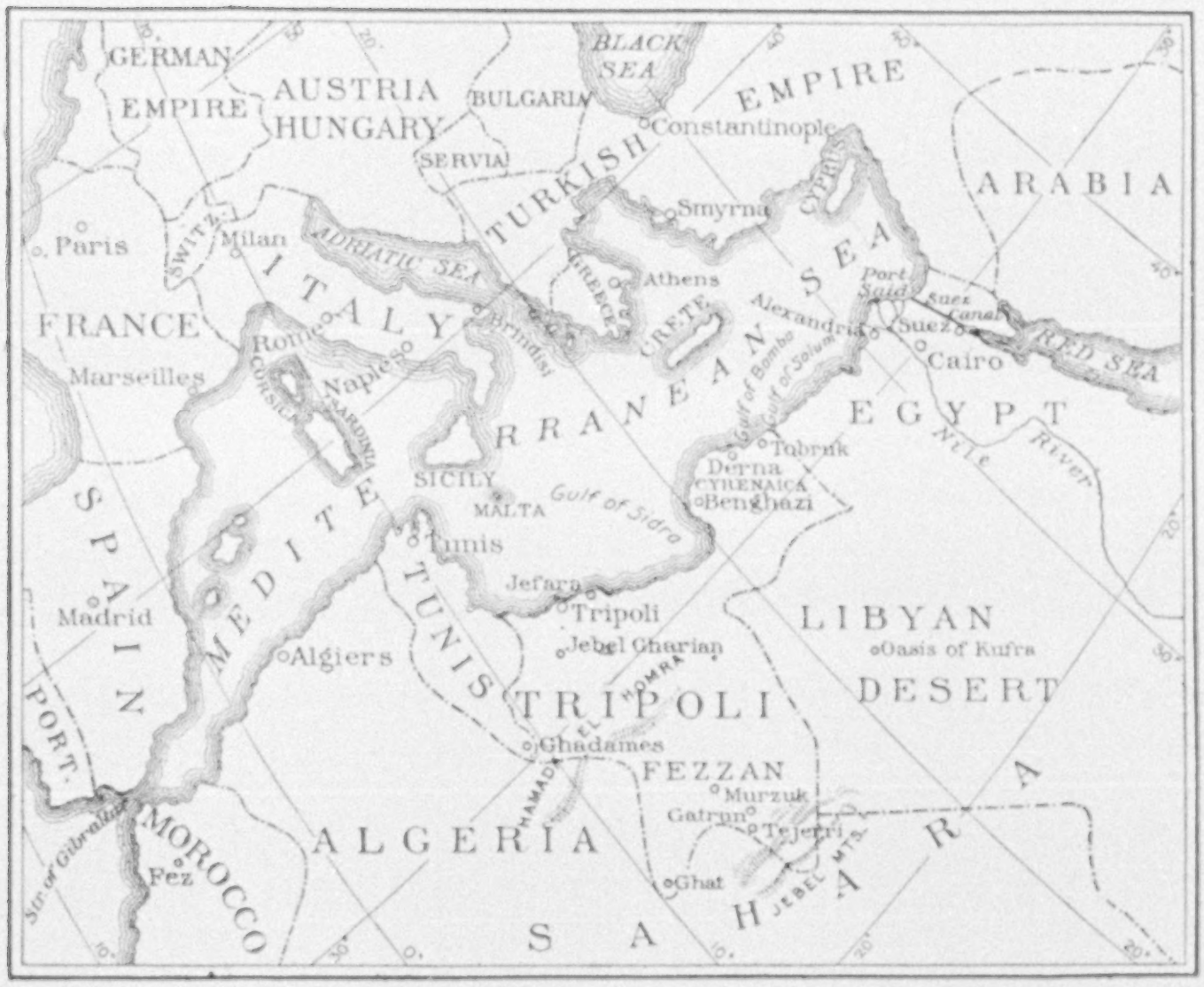
A RAIDING BAND OF TUAREG SERFS

"In their veins flows the blood of Berber ancestry, and in their language is preserved the purest speech of that tongue. The ancestors of these tribes were likely the most liberty-loving of that independent race, and probably, rather than be subjugated, they retreated into the vast spaces of the Great Desert. Here, at certain centers, they have towns built under the shade of the towering date-palms of the oases; but most of their life, often without food and shelter, is spent on the march."

that the French, who had established themselves in Algiers and Tunis, tried to deviate the caravan trade to these countries and thus make it avoid Tripoli.

Further, through the advent of European administration in Tunis, Algiers, and Egypt, all lawless elements of these countries retired to the eastern and middle Sahara, where they molested the passing caravans, thus making the route very unsafe.

But more important than all these causes just mentioned was the advent of European control in the Niger countries and Hausaland. Shipping was started on the great rivers Niger and Binue, and the communications with the west coast of Africa were greatly improved. The inauguration of the railway from Lagos to Kano, the greatest market in the western Sudan, is the end of these efforts. The goods of the Niger countries are now sent by ship or by rail to Dakar or to Lagos, from whence they reach Europe in a relatively short time. This new route is safer, cheaper, quicker than that of nearly 2,000 miles across the Sahara, where water is scarce and robbers abundant. The only route where the trade is still of some importance is that from Benghazi to Wadai, although it is a very difficult one. But it is more than probable that with the occupation of Wadai by the French the



OUTLINE MAP OF TRIPOLI AND HER NEIGHBORS

trade of this country will also be diverted to the west coast. With the gradual decline of this trade the lot of the inhabitants of Murzuk and Ghadames, who lived by this trade, became worse and worse. They cannot turn to agriculture, as these towns are surrounded by desert. "Ghadames is in a state of complete decay," says Mr. Pervinquière.

The trans-Sahara trade is practically dead. But the Sahara is, and for many years will still be, crossed by pious Moslems from the western Sudan who will perform their pilgrimage to the holy city of Mecca. Through these pilgrims an intellectual or spiritual communication will still exist between Tripoli and the heart of Africa.

THE GREAT RAINBOW NATURAL BRIDGE OF SOUTHERN UTAH*

By Joseph E. Pogue, United States National Museum

With Photographs by the Author

NEAR the southeast corner of Utah, in a remote and well-nigh inaccessible part of the Navaho reservation now given over to the use of the Piutes, is situated a natural bridge, called by the Navahoes *Nonnezoshe*, the stone arch, by the Piutes *Barohoini*, the rainbow, which surpasses any structure of its kind known to man. Even the other great bridges of southern Utah, the Caroline, the Augusta, and the Edwin, known since 1902, are exceeded in size and beauty by the rainbow arch. Discovered but little over a year ago, it has thus far been visited by less than 25 white men and described but once.†

Recently a United States Geological Survey party, consisting of H. E. Gregory, in charge; John Wetherill, K. C. Heald, and the writer, stood upon the summit of Navaho Mountain and looked over a country of wildness and grandeur. Fifty miles to the north the graceful peaks of the Henry Mountains outlined themselves against the horizon; much nearer, the Colorado and San Juan rivers united in the midst of a tilted and disjointed table-land; to the west, the Colorado was already beginning to make that wonderful mile-deep gash so fitly called the Grand Canyon; while to the south was visible the even skyline formed by the extensive tops of Black and White mesas. Turn in whatever direction one would, the scene was one of bewildering magnitude.

Nearer at hand, surrounding the mountain like an island, surged a billowy sea of red sandstone, carved into fantastic, rounded, and oval masses, colossal in size, between whose cross-bedded and swirling slopes wound deep and tortuous canyons. Hidden away in such a labyrinth, it is not surprising that the bridge remained so long unknown. Yet it is only four miles distant in a northerly direction from the mountain's summit, and is visible from this point as a tiny arch, provided one knows exactly where to look. Otherwise the eye may wander at will over this wilderness of rock without sighting its most interesting feature.

Although so close at hand, this goal was only reached after two days' time and a journey of 35 miles over a very indirect route. The mountain had to be descended to the south, a long detour made around its eastern flank, and a devious and winding course followed northward down the bridge canyon, over a trail ever difficult and ofttimes dangerous. The way led between lofty and perpendicular cliffs, towering to a sheer height of one-fifth of a mile, on whose vertical sides could now and then be descried the crumbling ruins of some ancient cliff-dwelling.

In places the walls overhung to form vast semi-spherical chambers, large enough to shelter a cathedral, and in which a shout echoed and re-echoed many times; in other places the sides approached so closely that the only foothold was in the rocky bed of the small stream below, where one was forced to pick a precarious passage from boulder to boulder.

After hours of laborious and intricate travel, a point was rounded and 500 yards ahead a graceful arch was outlined, beneath which the canyon and stream continued their flexuous partnership. The first view of the bridge is minimized by the lofty walls beyond and

* Published by permission of the Director of the United States Geological Survey.

† Byron Cummings. The Great Natural Bridges of Utah. National Geographic Magazine, v. 21 (1910), pages 157–167.

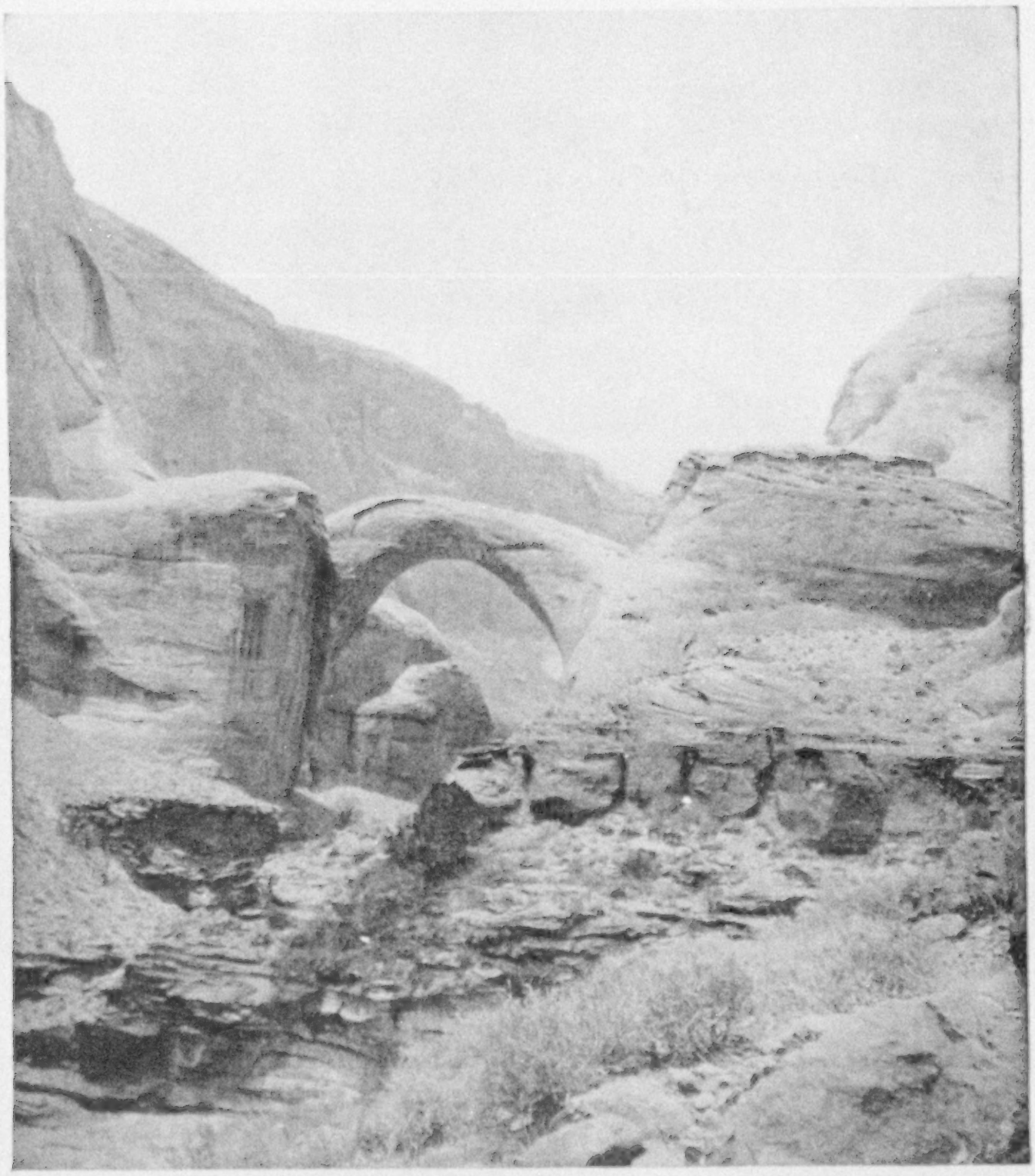


Photo by Joseph E. Pogue

A VIEW OF THE GREAT RAINBOW (NONNEZOSHE) ARCH FROM UP-CANYON, SHOWING THE LOFTY CANYON WALLS AND THE CHARACTER OF THE FORMATION FROM WHICH IT IS CARVED

The arch is carved from a buff-colored, fine-grained sandstone, brick-red upon its surface and stained with vertical streaks of a darker shade. Mostly massive, though in part oblique-bedded, the rock is only moderately firm, and is easily crushed beneath the blows of a hammer.

the comparatively narrow defile, through which it is only partly visible; but once passed under, it may be seen in its magnificence and entirety.

A towering arch, rainbow-shaped, of wonderful symmetry, rises nearly sheer from a ledge on the one side, and, spanning the stream, joins the opposite can-

Photo by Joseph E. Pogue

A CLOSE VIEW OF THE GREAT RAINBOW ARCH FROM UP-CANYON

"The arch is supposed by the Indians to represent the rainbow, or sun path, and one who passed under could not return without a certain prayer. Evidently Whitehorsebegay had forgotten this prayer and feared vengeance should he break the legendary prohibition. Nearly beneath the arch are the remains of an ancient altar built doubtless by the cliff-dwellers, indicating that the bridge was probably an object of superstitious worship, even to this ancient people" (p. 1053).

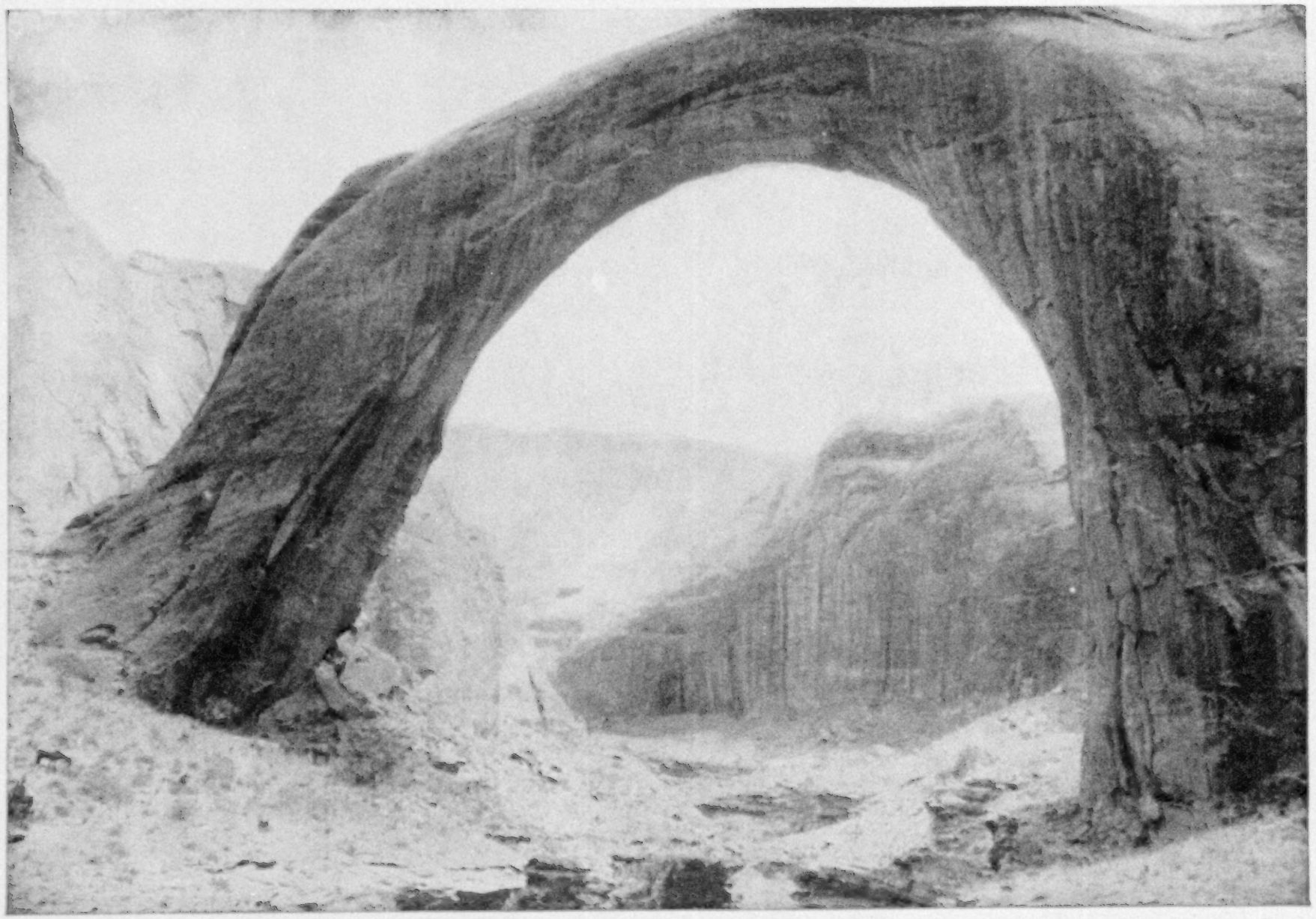


Photo by Joseph E. Pogue

THE RAINBOW ARCH AS SEEN FROM DOWN-CANYON: HEIGHT, 308 FEET; SPAN, 278 FEET

Its isolated position and remarkable symmetry are well shown by this photograph. The bridge is at once the largest and most remarkable known. Not only in size but in shapeliness does it surpass any of its rivals (see page 1054)

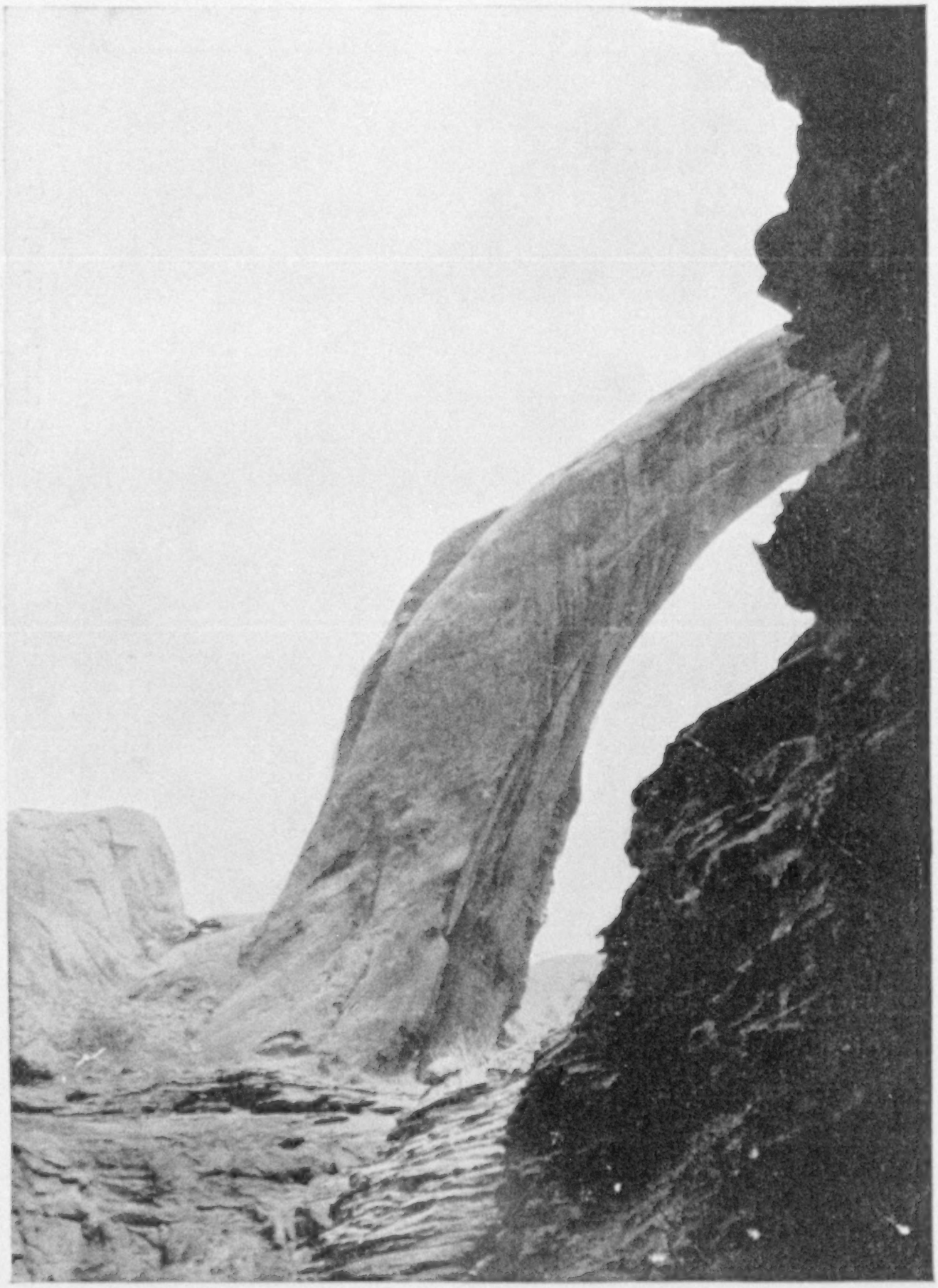


Photo by Joseph E. Pogue

A PORTION OF THE ARCH AS SEEN FROM THE BOTTOM OF THE GORGE AT SOME DISTANCE DOWN-CANYON

It would easily span, with room to spare, the dome of the Capitol at Washington, or, if hung over the Flatiron Building in New York, its limbs would come within a few feet of the ground, through to the west of Fifth Avenue on the one hand, and to the east of Broadway on the other (see page 1053).

yon wall on its downward curve. The opening, augmented by a gorge cut by the stream to a depth of 80 feet below the level of the supporting bench, measures a vertical distance of 267 feet; but the total height from stream-bottom to the top of the arch is 309 feet, while the abutments at their base stand 278 feet apart. The causeway, upon which one may be lowered from an adjacent cliff, but whose sides are too steep to serve for a complete passage, is 33 feet wide by 42 feet thick at its keystone point; and the limbs are not greatly in excess of these dimensions.

A mere recitation of figures must fail to convey an adequate idea of the imposing nature of the bridge. It is not the size alone, though this far exceeds the greatest masonry arches constructed by engineering skill; nor is it solely the graceful lines or curvature of maximum stability, but rather all of these, that combine to make this the most remarkable single arch now known. It would easily span, with room to spare, the dome of the Capitol at Washington; or, if hung over the Flatiron Building of New York, its limbs would come within a few feet of the ground, though to the west of Fifth Avenue on the one hand and to the east of Broadway on the other.

The arch is carved from a buff-colored, fine-grained sandstone, brick-red upon its surface and stained with vertical streaks of a darker shade. Mostly massive, though in part oblique-bedded, the rock is only moderately firm, and is easily crushed beneath the blows of a hammer. Geologically it is a part of the Upper La Plata sandstone, a formation of great thickness, deposited in Jurassic time over a large portion of southeast Utah, southwest Colorado, and northeast Arizona.

The origin of the arch is simple and evident. It was caused by the progressive narrowing of the neck of a meander intrenched between high and steep walls, until an opening was made through the tongue of intervening rock, permitting the stream to cut off its meander by flowing beneath the arch thus formed. The hole, once made, has been enlarged and given its present shape by the combined action of weathering, expansion, and contraction due to changes in temperature, and the carving effect of wind-blown sand, all of which unite to produce the rounded rock-forms so characteristic of this region. The abandoned arm of the meander is present and unmistakable, indicating the former course pursued by the stream.

Though doubtless requiring many years for its formation, the arch is nevertheless a very recent geological feature, and destined to withstand the forces that gave it being for only a brief period as geologic time is reckoned.

The bridge was first visited by white men and its existence made definitely known on August 14, 1909. It was then reached by a party consisting of W. B. Douglass, of the United States General Land Office, with four assistants; Byron Cummings, of the University of Utah, with three students; John Wetherill, of Oljato, Utah; and two Piute Indians, Jim and Nasjabegay. Douglass was acting under instructions from the Department of the Interior, dated October 20, 1908, to investigate a reported natural bridge in southeast Utah, with a view to making it a national monument if found of sufficient interest. An attempt was made in December, 1908, to locate the bridge, but was abandoned on account of snow. The search was renewed in August, 1909, the party being joined at Oljato by Cummings, Wetherill, and the three students. The arch was surveyed by Douglass, and the figures herein used, as well as the details of its discovery, are taken from his official report to the Land Office.

The bridge was undoubtedly known to the Indians prior to its discovery by white men; but as to the actual knowledge of it there is uncertainty. Douglass relates that Whitehorsebegay, his guide, on a second visit to the bridge, would not go beneath the arch, but laboriously clambered around one side whenever it was necessary to pass. Later Mrs. John Wetherill, an accomplished Navaho linguist, ascertained from an old Navaho that the arch is supposed to represent the rainbow, or sun-path, and one who

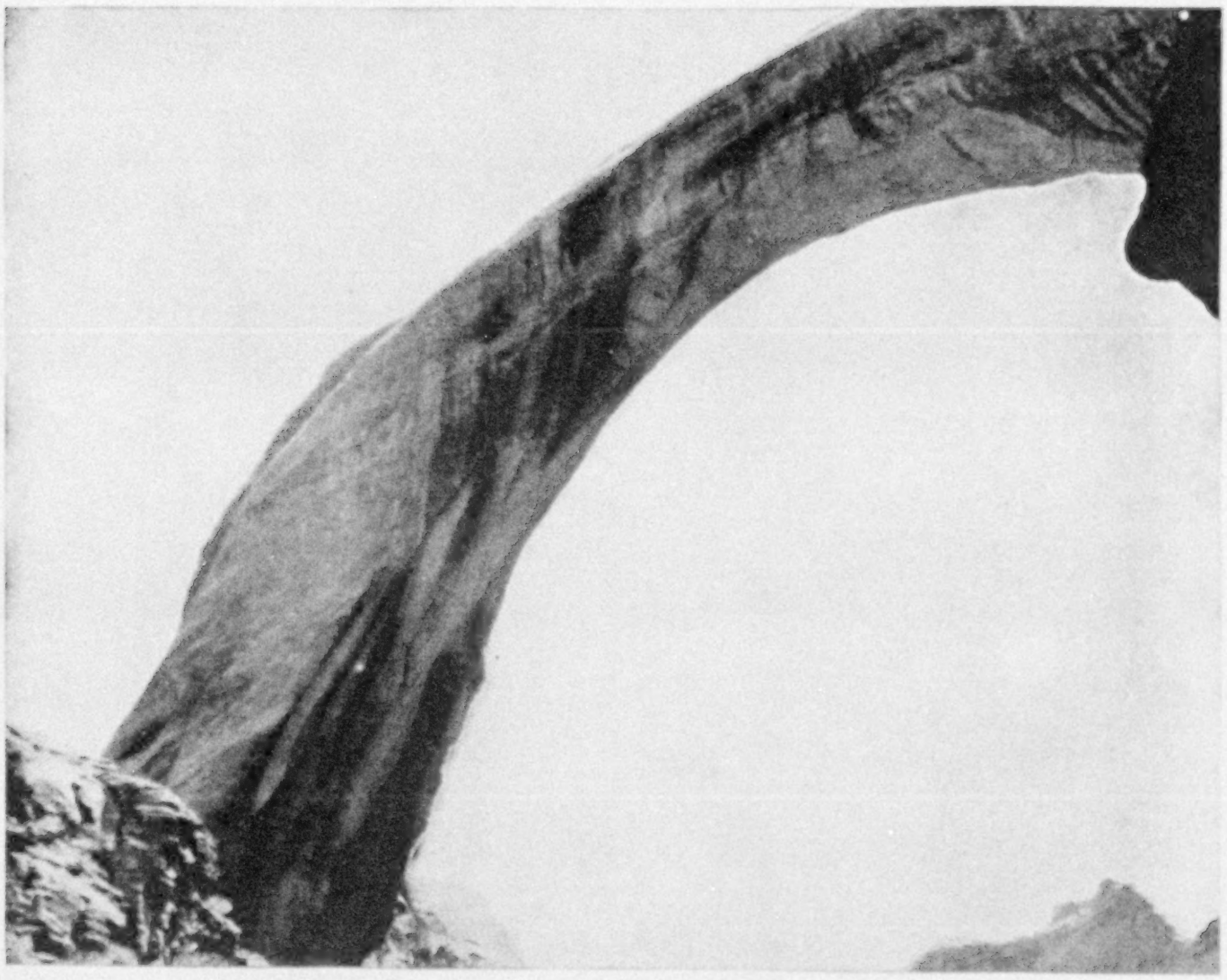


Photo by Joseph E. Pogue

VIEW OF A PORTION OF THE ARCH FROM A POINT NEARLY BENEATH

The causeway, upon which one may be lowered from an adjacent cliff, but whose sides are too steep to serve for a complete passage, is 33 feet wide and 42 feet thick at its keystone point, and the limbs are not greatly in excess of these dimensions (see page 1053).

passed under could not return without a certain prayer. Evidently Whitehorse-begay had forgotten this prayer and feared vengeance should he break the legendary prohibition. Nearly beneath the arch are the remains of an ancient altar, built doubtless by the cliff-dwellers, indicating that the bridge was probably an object of superstitious worship even to this ancient people.

The bridge is at once the largest and most remarkable known. Not only in size but in shapeliness does it surpass any of its rivals. Below is tabulated for comparison the dimensions in feet of the largest of the natural bridges, the measurements of the first four taken from the surveys of W. B. Douglass.

The exact location of the bridge is latitude 37° 03′ 21″ and longitude 110° 56′

	Height.	Span.	Width.	Thickness.
The Barohoini (rainbow) or Nonnezoshe (stone arch), southeast Utah	309	278	33	42
The Sipapu (gate of heaven) or Augusta, southeast Utah	220	268*	31	53
The Kachina (guardian spirit) or Caroline, southeast Utah	210	277†	44	50
The Owachomo (rock mound) or Edwin or Little, southeast Utah	106	180	28	9
The Virginia Natural Bridge	200	45	..	..
Pont d'Arc, France	197	213	..	..

* Arch skewed; span with axis, 283 feet.

† Mean span, 275 feet; greatest span, 350 feet; least span, 202 feet.

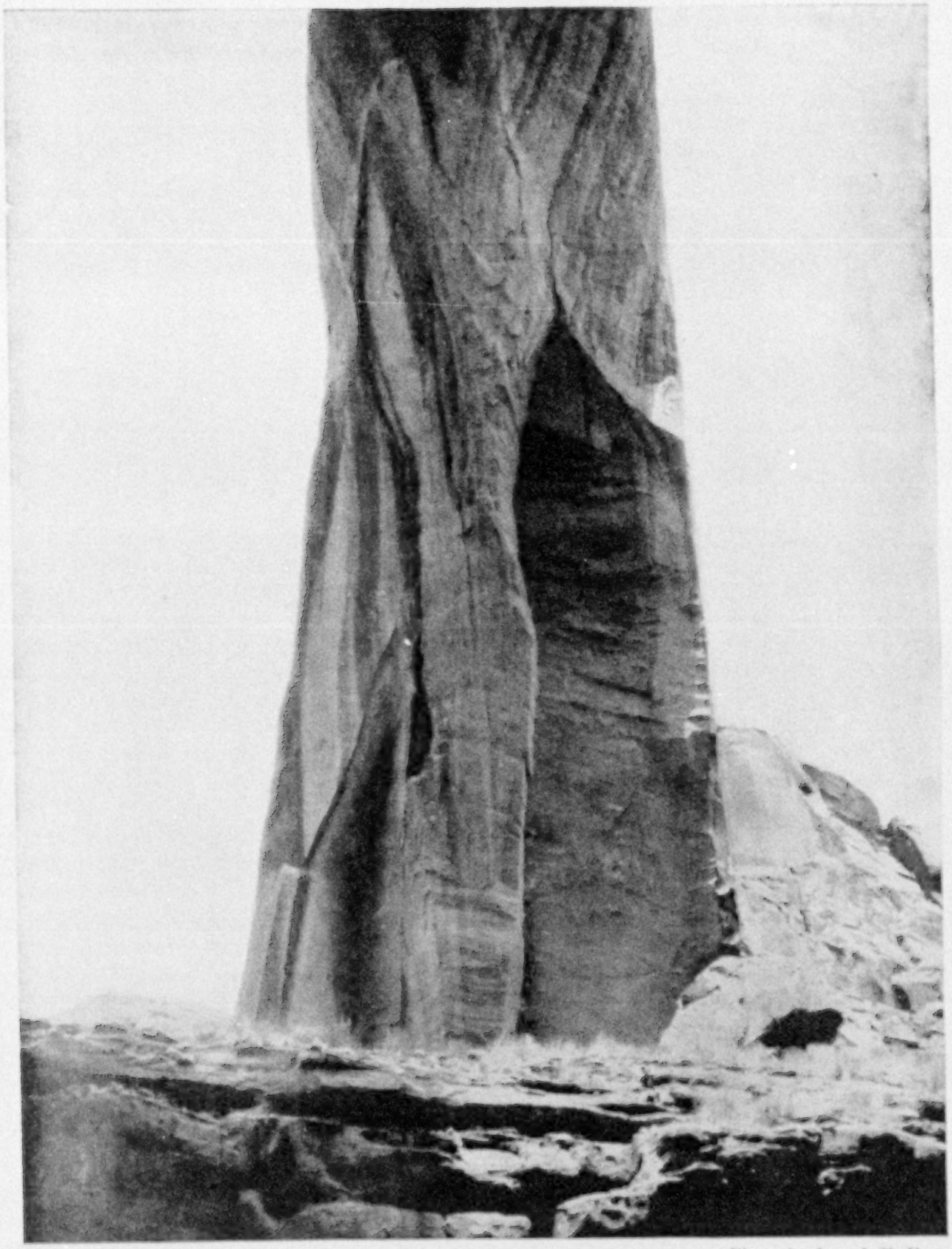


Photo by Joseph E. Pogue

ONE LIMB OF THE ARCH PHOTOGRAPHED FROM THE BASE OF THE OPPOSITE LIMB

This picture brings out, perhaps, more than any other the imposing proportions of the structure

48″ west of Greenwich (Douglass), in San Juan County, Utah; six miles northward from the Arizona-Utah boundary line; four miles west of north from the summit of Navaho Mountain, and four miles above exit of the bridge canyon into the Colorado River at a point 16 miles below its confluence with the San Juan.

The most exact directions for reaching the bridge would be inadequate, so obscure and devious is the trail leading thereto; hence the services of a guide are indispensable. Oljato, Utah, where guide and outfit for the final portion of the trip may be secured, is reached by two routes, between which there is little choice. On the one hand, Gallup, New Mexico, on the Santa Fé line, may be made the starting point, whence one must go by stage 35 miles to Fort Defiance, Arizona, and from there by wagon or pack outfit 155 miles in a northerly direction to Oljato. On the other hand, the traveler may leave a branch of the Denver & Rio Grande Railroad at Dolores, Colorado, stage 81 miles to Bluff, Utah, and there secure horses for the remaining 60 miles to Oljato. The bridge is distant from Oljato only 37 miles, as the crow flies, but the trail passes over twice this distance, and three days will be required for this last and most difficult part of the trip. A minimum of 18 days should be allowed for the round trip, whether the start be made from Gallup or Dolores, and the journey may be accomplished at any time during the year save in winter. The trip is an extremely arduous and toilsome one, and would be fraught with danger to an inexperienced traveler, but under competent guidance may be accomplished with no special hazard, though hardships and inconveniences, and many of them, must be expected.

The government has already made of this natural wonder a national monument, thus preserving it for all time against vandalism and commercialism and conserving it for the enjoyment of all.

THE MYSTERIES OF THE DESERT

The following article is abstracted from "Across the Sahara," by Hanns Vischer, one of the few explorers who have traversed Tripoli and the Sahara to Bornu:

THERE are many hamadas in different parts of the Sahara. The Hamada el Homra, the red wilderness, stands first among them all (see map, page 1047).

The great range which bars the road to the south between the coast and Fezzan rises here in one great, solid plateau of chalk to a height of 1,800 feet above the sea-level. It is a mighty sheet of rock falling off to the east, 360 miles from east to west and about 140 miles broad where the road crosses it.

Except for a few narrow depressions, which lie like islands in the surrounding desolation, the surface is of solid rock, covered everywhere with small red stones and little bits of chalk, doubtless the remainder of former layers which have long ago disappeared. Heat and cold break up the surface, and the incessant wind carries away every loose particle of sand, finally piling it up into large dunes somewhere in the desert around. The surface is swept clean as with a broom, and the polishing action of the drifting sand gives the stones the appearance of being varnished.

The hot air trembles over this shining surface, reflects the blue of the sky in every little depression of the ground, and distorts distant objects into fantastic shapes. Hollows in the rock appear as dim, blue lakes, and wandering camels on far-off rocks are transformed and magnified into the semblance of dark palm groves or strange-shaped hills. These are the games the hamada devils play to terrify and mislead the luckless caravans. For five days in the Hamada

el Homra the horizon lies around the traveler in one unbroken line—one infinite plain as far as the eye can see.

In the wilderness we had left behind us the ever-varying mountains rested the eye, and the mind instinctively imagined green fields and trees somewhere beyond the ridges. Here in the hamada, however, the desert, naked and hopeless in its desolation, lies ever before one. By day or by night, nothing interrupts the stillness of death save the mournful notes of the wind sighing among the stones. The endless disk of red rock over which the caravan slowly marches is closed in by the arch of the sky, steel-blue to the very edge of the horizon. And in this sky is set "a tabernacle for the sun, which is as a bridegroom coming out of his chamber, and rejoicing as a strong man to run a race. His going forth is from the end of the heaven and his circuit unto the ends of it, and there is nothing hid from the heat thereof." Only dawn and sunset paint earth and sky with colors more glorious than pen can describe.

The wonderful clearness of sun, moon, and stars, as they move through the silent heavens; the divine beauty of morning and evening—all bear the sign of eternity, before which man's wildest imaginations fall into insignificance. This is, indeed, the Garden of Allah; not of the bountiful God who is worshiped with harmonious chants of love in the soft, incense-laden atmosphere of a cathedral, but the Jehovah of Israel, a consuming fire, on whom no man can look and live.

A little speck on the endless plain, the caravan advances, pressing forward in anxiety to leave this abode of death, where shouts and laughter cease and the human voice is drowned in the heavy stillness.

SINGING MOUNTAINS

The highest and most prominent point in the range is a mountain called Jetko, a dark and forbidding rock frowning over Bilma and the southern end of the oasis. This mountain warns the inhabitants of the approaching arrival of a caravan, for when it "sings" the men know that a caravan is close at hand. The noise is produced by the blowing of the wind from a certain direction through the crevices of the torn rock. It was clearly heard by the French officers one night. Commandant Gadel says, in his report: "On the 6th of October, in the morning, the old Liman came to tell me that the mountain had spoken. On the 8th of October, at 10 in the morning, the first Asbin caravan arrived. It consisted of 4,851 camels and 857 men. The mountain had not lied." *

Awaiting a scientific explanation, we can only note these facts. The desert is still full of mysteries. Major Djamy Bey told us that while in the neighborhood of Ghat, a Tuareg one day drew his attention to some large clouds which appeared most unusually on the horizon. The Tuareg assured the Bey that these clouds only showed when there was a large caravan on the road from Ganet, and two days later a special messenger brought the intelligence that a French expedition had arrived at Ganet! By similar clouds the Tuaregs maintained that they could foretell the arrival of every large caravan long before they had any other definite news of it. The mountain Jetko sang even while I was with the French at Bilma. And the caravan came.

One morning we noticed far out on the west, on the round, brilliant backs of the sand dunes, long dark blots. Quite imperceptibly they increased in size and drew nearer, like the great shadow of a cloud. It was an Asbin caravan of over 8,000 camels and 1,000 men. The arrival of these caravans is naturally the most important event of the year to the people of the oasis. The Asbinawas bring millet and grass from Air, wood for camel saddles, Manchester cloth, Hausa robes, and all the luxuries which can be found in the Kano market. Men, women, and children arrive from all the villages to buy their provisions for the year, which the Tuaregs give them in exchange for salt and dates. Formerly the Asbinawas forbade the inhabitants to cultivate millet, in order to force them to work the saltings and grow dates.

* Gadel, "Notes sur Bilma et les oasis environnantes," Revue Coloniale, Juin 1907.

The great encampment, with the many thousand camels, the stacks of grass, and piled-up loads, looked like an immense fair. The oasis, of course, could never support all these animals, so the Asbinawas, before they leave Air, feed up their camels on the fattest grazing grounds, and then, having chosen only the fittest animals, load about a third of the number with grass, which is used for fodder on the way. Great quantities are buried in the sand at intervals, to be used on the return journey; for on that desolate stretch of desert, water is very rare and not a blade of grass grows between the interminable sand dunes.

For us the arrival of this caravan was most welcome. Every member of my little family went out to buy stores and provisions for the march to Bornu, for which we were getting ready.

SCENES AT MURZUK

In the Fezzan of today one meets representatives of almost every tribe from Egypt to Timbuktu, from the Mediterranean to Lake Chad; descendants of slaves and conquerors, original inhabitants and refugees.

Everywhere one finds the remains of great square towers, once citadels that stood in the middle of large towns. The grass huts of the inhabitants vanished before the fire and sword of the successive invaders, leaving nothing to recall their existence but the huge, solid citadels, built of salt-saturated mud, which defy the surrounding desert. Murzuk survived longest, as it was situated on the route from Tripoli to Bornu and to Ghat, and immense caravans continued to pass between the coast and Kuka. But it was an artificial existence, for most of the wealth was in the hands of the foreign traders.

With the subsequent European occupation of equatorial Africa, the export of slaves ceased and the Tuareg and Tubbu brigands became the lords of the desert, as the well-armed Arab caravans of former days grew fewer and fewer.

Murzuk has now lost its last source of income, and the Turkish administration of today is faced with the difficult problem of the confidence of the people in the value of their own country, independent of the Arab trans-Saharan trade.

The town of Murzuk lies in a well-watered natural depression at the southern and lower end of the hamada. Southward the open desert, with its bright yellow dunes, stretches to the very walls of the town. East and west, in irregular groups, the green palm groves follow the direction of the hofra.

Murzuk is built in the fashion of all Bornu towns, and like them it is surrounded by a number of large pits whence the material was taken for the great mud castle and the houses. Most of the pits are filled with stagnant water, which accounts for the innumerable mosquitoes and the bad health of the Murzuk people. In the middle of the dry and healthy desert, the inhabitants of Murzuk always suffer from malaria, and nearly all the former travelers complained of bad health during their stay there.

Right through the midst of the town runs the Dendal, the high street, with the market-place at one end, near the last gate, and the castle and the mosque at the other. Just like every town and village in Bornu, the town walls still surround an extent of open ground which was never built over, but has been used for growing crops in time of siege.

There is so much salt on the surface of the ground all through the depression that the mud-built walls of the buildings look as if they were covered with a hoarfrost, which sparkles and glitters in the sun. The salt mud gets extremely hard when it dries, and this accounts no doubt for the solid appearance of the old castles, which for centuries have withstood the ruin of the encroaching desert. On the other hand, when an occasional rainstorm comes over Fezzan it is disastrous to the buildings which happen to stand in its way. I was told of one town, Temahint, which was completely wiped out; or, to be more accurate, washed out, by an unusually severe rainstorm.

I had in my own house a large, solid waterpot; and, after the fashion of my country, used the water carelessly till to my amazement I saw the pot suddenly

slide through the hole which the water had made to the floor below!

The fort of Murzuk is an enormous structure, not unlike a gigantic ant-heap, of hard mud pierced by dark passages leading to spacious rooms, which are lit by a few small windows.

But it is the women of Murzuk who give all the vitality and color, and if the town, and with it the whole Fezzan, ever rises from its present miserable condition, it will surely be mostly due to the spirit of these gay Fezzan ladies. Free from the restraining laws of the stricter people of the north coast, the Fezzani girls have no use for the veil and believe little in the sanctity of the harem. Their laughter, which resounds above all the more serious noises of a market, is like that of children, and if their jests sometimes verge on the improper and their manners are not ruled by the laws of the Koran, they have most cheerful manners, in which the eternal feminine, the gaiety of the negro, and the ready tongue of the Tripolitan blend together, even as all the wit and humor of Kanuri, Hausa, Targhi, and Arabic have been collected in their language.

Their complexions, so refreshing after the veiled mummies of North Africa, are of all the shades, from ebony-black to light *café au lait*. The commonest type of face is like that of the Sphinx at Ghizeh, with straight nose, large mouth, and merry, thick lips, always ready to break into a smile. They are dressed in a sort of chemise, dyed with indigo and embroidered down the front, like those worn by Kanuri women. Over this they wear a long piece of blue cotton cloth slung round the body in all sorts of fashions and tucked in close under the arms. Over their heads and the greasy hair, falling in many small tresses on both sides of the face and slimy with rancid camel butter, they wear, like a mantilla, a square piece of woolen cloth, dyed a bright red. With their large silver earrings, heavy bangles and anklets, shrill but not unpleasant voices, henna-dyed hands, coal-black eyes, and shining white teeth, their whole appearance expresses a gay defiance of the melancholy desert which surrounds them.

THE TUAREGS (SEE ALSO PAGE 1046)

The Tuaregs, found in the vilayet of Tripoli, are descended from the Auxoriani of old, who in the fourth century took Leptis from the Romans after eight days' siege. Later they were driven west and lived with the Hoggar Tuaregs, who finally quarreled with them and forced them to migrate. They then settled around Ghat and devastated the country, according to their usual fashion.

Amongst the Tuaregs it is man the brute who by all the laws of the country has to obey the women. Descent is traced through the mother; woman shows her proud face to all the world, while the man goes veiled. In the presence of a woman of noble birth, men cover their faces and heads altogether. The women give the children what little instruction they have and train them to respect and obey them.

Bullied and worried by his womenfolk, the Tuareg has no liberty at all. All the goods, tents, camels, and clothes are the women's property. The stick he carries and the great wooden box into which he puts what his wife suffers him to have are all the man possesses and all he retains if for some reason his wife chooses to divorce him.

In Ghat, when a man goes out after sunset he is usually followed by a negro servant, sent by his wife to dog his steps, and woe to him if he forgets himself or comes home too late! He will find the door shut and must count himself lucky if he is not put onto the street altogether.

The young man who, in spite of all this, wants to marry must pay a heavy sum for the bride, to obtain which he is obliged to look for other means than his usual work of rearing camels or carrying goods for the Arab trader. Thus he is forced into taking part in one of the annual *rhazzias*.

The ladies decide when the right moment has come, and the men sally forth against some luckless caravan or to the rich highlands of Tibesti. These senseless raids have destroyed many a fertile oasis, and have accelerated the final disappearance of trans-Saharan trade.

PROGRAM OF MEETINGS OF THE NATIONAL GEOGRAPHIC SOCIETY

Realizing that the largest available auditorium is inadequate to accommodate all members of the National Geographic Society who desire to attend the lecture course, the Board of Managers have arranged to give each lecture during the season of 1911-12 twice on the same day, in the same hall (the New Masonic Temple).

The first lecture will be at 4.50 p. m. and the second at 8.15 p. m.

The afternoon and evening lectures will be identical in all respects. The majority of the addresses will be published in the magazine of the Society.

November 17.—"Present Conditions in China." By Mr. Frederick McCormick. Mr. McCormick was for many years Associated Press correspondent at Peking, and is personally acquainted with the leaders of the recent government changes in China. He speaks Chinese and is a student of Chinese literature and history. His articles in *The Outlook*, *Century Magazine*, etc., have made him well known to the American public.

November 24.—"Tripoli of Barbary: the Gateway to the Sahara." By Mr. Charles W. Furlong, author of a fascinating volume on the same subject. It was Mr. Furlong who located, in the harbor of Tripoli several years ago, the wreck of the U. S. frigate *Philadelphia*, which was sunk by Decatur in 1804.

December 1.—"Italy of Today." By Mr. Arthur S. Riggs. Mr. Riggs will give an account of the Italians and describe some of the art treasures of Italian cities. The lecture will be wonderfully illustrated with colored lantern slides and moving cycloramas.

December 8.—"The Young Turks." By Rear Admiral Colby M. Chester, U. S. Navy.

December 15.—"The Blackfeet Indians." By Mr. Walter McClintock, author of "The Old North Trail" and adopted son of Chief Mad Wolf.

January 5, 1912.—"A Woman's Climbs in the High Alps: the Ascent of Monte Rosa, the Breithorn, the Matterhorn, and Mont Blanc." By Miss Dora Keen. With colored slides and motion pictures.

January 12.—"The Balkan States: Montenegro, Servia, and Bulgaria." By Mr. E. F. Newman. The ambitions, beauties, and romance of this picturesque part of Europe will be described by one who knows them well. With colored slides and motion pictures.

January 19.—"What the Japanese Have Done for Formosa." By Dr. Inazu Nitobe, of the University of Tokyo. Illustrated with colored slides.

January 26.—"Morocco and Her Neighbors." By Mr. Frank Edward Johnson, author of "Tunis," "The Molemen," etc., in the NATIONAL GEOGRAPHIC MAGAZINE. Illustrated with colored slides.

February 2.—"How the World is Fed." By Dr. H. W. Wiley, Chief of the Bureau of Chemistry of the Department of Agriculture. Illustrated with colored slides.

February 9.—"Personal Experiences in the Far East." By Mr. George Kennan, author of "Tent Life in Siberia," "Siberia and the Exile System." Illustrated with colored slides.

February 16.—"From the Amazon to the Orinoco: the Five Guianas—Brazilian, French, Dutch, British, and Venezuelan." By Mrs. Harriet Chalmers Adams. With colored slides and motion pictures.

February 23.—Dr. Alexander Graham Bell will address the Society. The subject of the lecture will be announced later.

March 1.—"The Oceans and Their Inhabitants." By Hon. O. P. Austin, Chief U. S. Bureau of Statistics and Secretary of the National Geographic Society. With colored slides and motion pictures.

March 8.—"The Glaciers of Alaska." By Prof. Ralph S. Tarr, of Cornell University, and leader of the National Geographic Society's Alaskan expeditions of 1909-1911. Illustrated with colored slides.

March 15.—"A Naturalist's Observations in Colombia." By Mr. Frank M. Chapman, of the American Museum of Natural History. Illustrated with colored slides.

March 22.—"In the Wilds of Brazil, with an Account of Roraima and Kaieteur—the Great Mountain and the Great Falls of the Guianas." By Dr. Henry E. Crampton, of the American Museum of Natural History. With colored slides.

March 26.—"Paul at Athens." By Dr. Mitchell Carroll, Secretary of the Archæological Institute of America.

March 29.—It is hoped that Captain de Chambrun, military attaché of the French Embassy, will be able to accept the invitation of the Society to give an address on "French Explorations in Africa." Count de Chambrun has taken a distinguished part in the exploration of North Africa, and has made notable contributions to our knowledge of portions of the continent.

April 5.—"Japanese Gardens." By Miss Eliza R. Scidmore, author of "Jinrikisha Days in Japan," "China, the Long-lived Empire," "Java, the Garden of the East," etc. Illustrated with colored slides.

April 12.—"Man's Deadliest Foes: the Fly and the Mosquito." By Dr. L. O. Howard, Chief of the Bureau of Entomology; author of "Mosquitoes: How They Live," "The House Fly," "The Insect Book," etc. With colored slides and motion pictures.

New Books of Travel for Travelers and Readers of Travel Books

A Search for the Apex of America

By ANNIE S. PECK, M. A.

A wonderful story of perseverance, courage and final triumphant achievement is this story of four trips to South America in quest of the highest mountain in the Western Hemisphere. The interest leads up to and culminates in the account of a partial ascent of Mt. Sorata, in Bolivia, and of the successful ascent of the loftier and more difficult Mt. Huascaran, in Peru. *By this truly remarkable exploit Miss Peck reached an altitude* 1500 *feet higher than Mt. McKinley, and thus outclimbed any man residing in this country!* This magnificent mountain Miss Peck brought to the attention of the civilized world in 1904, though not until 1908 did she, after incredible perils and privations, succeed in reaching the summit. Her further explorations include a visit to the source of the Amazon, and two ascents in that region of beautiful lakes and innumerable rocky and snow-clad peaks.

With more than 100 *illustrations from original photographs. 8vo,* $3.50 *net; postpaid,* $3.72.

Life in the Moslem East

By PIERRE PONAFIDINE

Russian Imperial Consul General at Constantinople

Bagdad, the city of the benevolent Caliph Haroun-al-Raschid; the ancient country of Mesopotamia, round about it; Mecca, Medina, and certain remote parts of Asia Minor and Persia have furnished the material for this very entertaining and valuable book. By pen and camera M. Ponafidine presents vivid pictures of this intensely Mohammedan portion of the world as it is today, and has much to say about Mohammedanism, its history, sects, orders, practices, etc., which will make his book of great interest to the general reader and of great value to the student.

Illustrated. Large 8vo, $4.00; *postpaid,* $4.29.

Cathedral Cities of Italy

By W. W. COLLINS, R. I.

With 60 full-page illustrations in color from paintings specially made for this work by Mr. Collins.

Unusually interesting for artists, travelers, architects, and lovers of the beautiful is this new volume from the hand of the author of "Cathedral Cities of England," "Cathedral Cities of Spain," etc.

Large 8vo, cloth, $3.50 *net; postpaid,* $3.72.

Cathedral Cities of Spain—A New Edition

By W. W. COLLINS, R. I.

A new edition containing the text and full-page illustrations in color, 60 in number, of the expensive earlier edition.

8vo, cloth, $2.00 *net; postpaid,* $2.17.

Honeymooning in Russia

By RUTH KEDZIE WOOD

Modern Russia, treated in a statistical, impersonal manner, might be the excuse for a dry-as-dust sort of volume. But Modern Russia, as seen by a very alert, observant and impressionable American bride, instantly becomes a country to charm the casual reader.

With 48 *illustrations. 8vo,* $2.00 *net; postpaid,* $2.18.

The American Woman Abroad

By BLANCHE McMANUS

For the benefit of all American women who intend to travel abroad without the appendage of a "mere man," the author has written a most useful, comprehensive, entertaining, and, in short, indispensable book. As guide, counsellor, friend, chaperon, courier, etc., this book tells one what to do, and, equally important, what *not* to do, when traveling in Europe.

With 40 *illustrations. 8vo,* $2.00 *net; postpaid,* $2.20.

Egypt as Seen and Described by Great Writers

Compiled by ESTHER SINGLETON

In this volume is collected the greatest word paintings in literature of mysterious and majestic Egypt—the land of the Pyramids and the Sphinx.

With 48 *illustrations. 8vo,* $1.60 *net; postpaid,* $1.79.

DODD, MEAD & COMPANY, *Publishers,* Fourth Avenue and 30th Street NEW YORK.

"Mention the Geographic—It identifies you."

Santa Fe de=Luxe

The only extra-fare train to California - extra fast and extra fine

California Limited

Also exclusively for first-class travel

Fred Harvey dining-car meals

On the way visit the world-wonder

Grand Canyon of Arizona

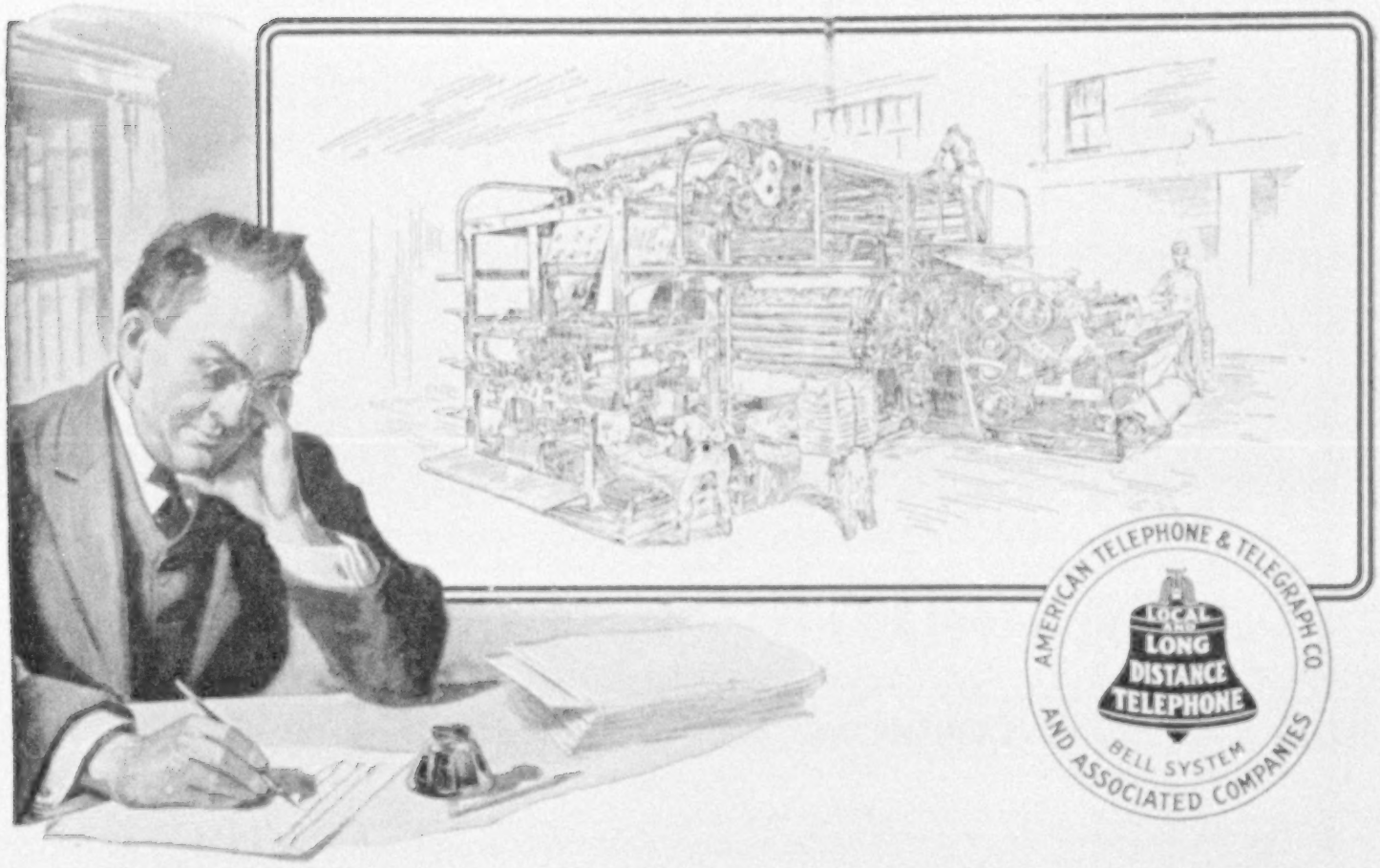
Santa Fe

All the way

For art booklets of both trains address W. J. Black, Pass. Traffic Mgr.
A. T. & S. F. Ry. System 1082 Railway Exchange, Chicago

© W. J. BLACK 1911

"Geographic readers may depend upon the integrity of our advertisers."



For Universal Service

The Press and the Bell System

The power of the individual writer is multiplied by the printing press. In the same way the power of the individual telephone is multiplied by the Bell system. In both cases, increased usefulness comes from progress towards universal service.

By means of the press the knowledge and thoughts of writers are spread throughout the land, maintaining among all the people the common language and the mutual understanding which makes for national co-operation.

By means of the Bell system, each individual telephone becomes connectable with every other telephone and each unit in the nation is given a personal membership in the most highly developed system of communication that the world has ever seen.

The press prepares people for co-operation; the Bell telephone system enables them to really co-operate. The press educates people separately; the telephone enables them to act upon their mutual knowledge immediately and at any distance.

By co-operation with telegraph and cable systems, universal service for communication is being made international.

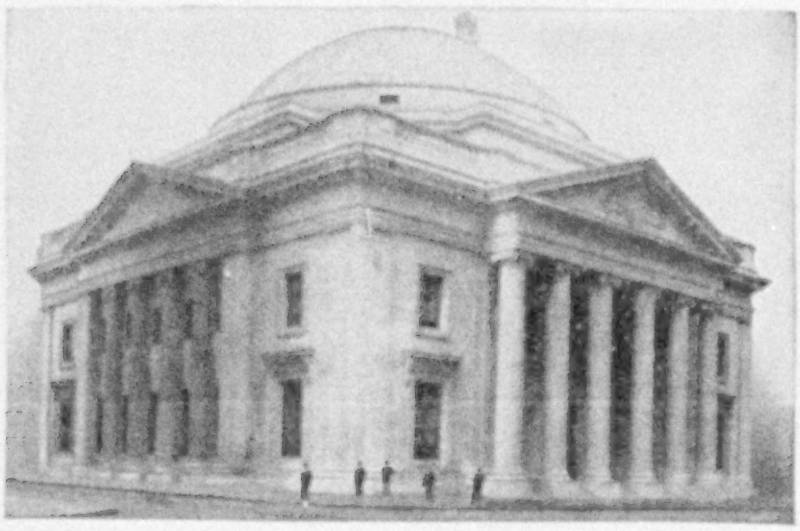
AMERICAN TELEPHONE AND TELEGRAPH COMPANY
AND ASSOCIATED COMPANIES

One Policy *One System* *Universal Service*

"Mention the Geographic—It identifies you."

XUM

CHARTERED 1836



GIRARD TRUST COMPANY

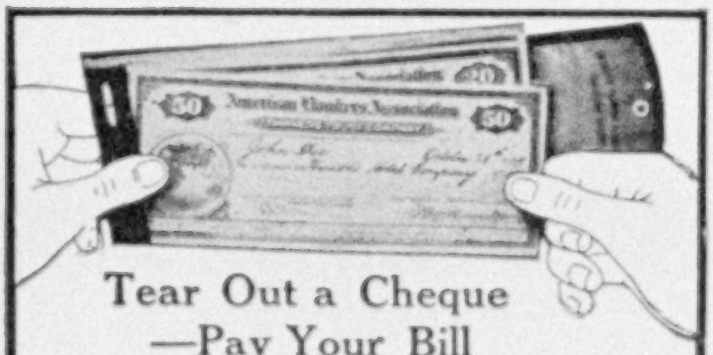
PHILADELPHIA, PA.

CAPITAL AND SURPLUS, $10,000,000

OFFICERS

EFFINGHAM B. MORRIS, President

WILLIAM NEWBOLD ELY . 1st Vice-President
ALBERT ATLEE JACKSON . 2d Vice-President
CHARLES J. RHOADS . 3d Vice-Pres't & Treas.
E. S. PAGE . . . . . Secretary
GEORGE H. STUART, 3D . . Assistant Treasurer
SAMUEL W. MORRIS . . . Assistant Secretary



Tear Out a Cheque —Pay Your Bill

Before starting on a trip Abroad or in America, buy a supply of "A.B.A." Cheques from your Banker. To pay a bill, take a cheque from the wallet, counter-sign it and tender as money.

AMERICAN BANKERS ASSOCIATION TRAVELERS' CHEQUES

are received *at par* in most countries and in the rest at London or N. Y. exchange rates, in payment for hotel service and other travel expenses, and by the U. S. Government for Customs Duties. They are safe, handy, negotiable at any time and everywhere. Take a few $10, $20, $50 and $100 cheques on your next trip.

Write for information as to where these cheques may be obtained in your vicinity, and interesting booklet—*"The Cheque that Identifies."*

BUY THEM FROM YOUR OWN BANKER
OR IF HE CANNOT SUPPLY THEM APPLY TO
BANKERS TRUST COMPANY, NEW YORK CITY.

A first mortgage 5% bond to yield 5.45%.

Average net earnings for past five years nearly three times interest on these bonds.

Company has paid dividends of 6% for 13 years on its outstanding Preferred stock.

Price and Particulars on application.

Write for Circular 232.

Knauth, Nachod & Kühne
Bankers

15 William Street New York City

"Geographic readers may depend upon the integrity of our advertisers."

A DEPENDABLE INVESTMENT

Yielding About 5.35%

Denomination: $1000 — Interest Payable $25 each May and November
Payable November 1, 1937 — Cost: Approximately $950 with accrued interest

We own, offer, and recommend

PACIFIC GAS AND ELECTRIC SYSTEM

California Gas & Electric Co. Unifying and Refunding
Mortgage 5% Sinking Fund Gold Bonds

A mortgage lien, subject to prior issues, on property estimated to have a replacement value of $68,500,000, representing an equity of about 41% over the entire outstanding bonded debt.

The property subject to the lien of these bonds is in excellent physical condition, over $16,450,000 having been expended on it in the last seven years. Of this amount over $5,000,000 was from surplus earnings.

The Pacific Gas & Electric System, one of the largest public utility properties in the United States, serves an area of 37,950 sq. miles, or one-half the size of all the New England States combined; serves most of California's important cities, and two-thirds of her entire population.

Earnings, as certified by accountants

Gross	$14,229,228.05
Net	5,938,622.76
All interest charges	3,006,156.16
Balance	2,932,466.60

Gross Revenue has increased since 1906 at the average rate of over $1,000,000 per annum.

We offer the above bonds at the current quotation on the New York Stock Exchange, and are prepared to furnish to prospective purchasers the results of the investigations of the various experts who have examined this property for us.

Send for descriptive circular A.N.-63

N. W. Halsey & Co.

Dealers in Government, Municipal, Railroad, and Public Utility Bonds

NEW YORK
49 Wall St.

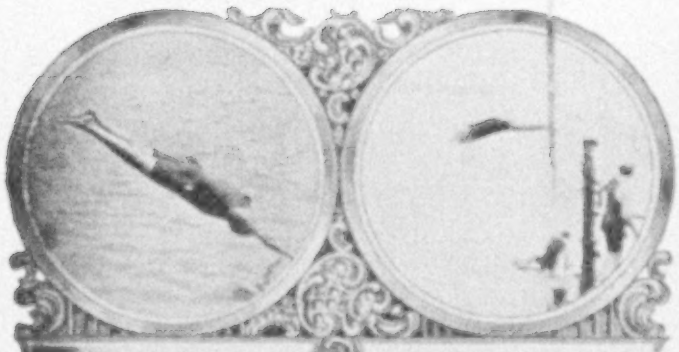
PHILADELPHIA
1421 Chestnut St.

CHICAGO
125 W. Monroe St.

SAN FRANCISCO
424 California St.

"Mention the Geographic—It identifies you."

XUM



HAS THIS HAPPENED TO YOU?

If it has, unless your equipment is

The Graflex-Steinheil Combination,

don't blame your camera or lens.

The "Graflex-Steinheil" is speedy enough for the speediest subject. Its efficiency is *bound* to be appreciated on the first trial. Fifty per cent more light latitude; no judging of distance necessary; seeing your subject right side up, to exposure time, are some "reasons why."

Our booklet contains interesting information. Write for it.

HERBERT & HUESGEN CO.

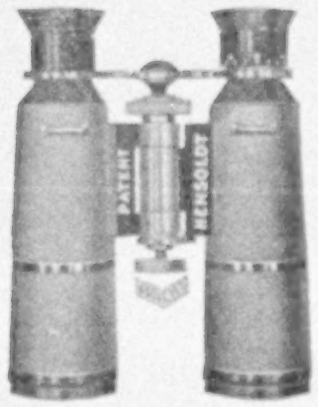
Specialists in Things Photographic

311-A Madison Ave. New York City

The "HENSOLDT"

PRISM BINOCULAR possesses the largest Field and Light gathering Power created by a new Prism combination. "Adopted by the Leading Armies and Navies of the World."

SEND FOR DESCRIPTIVE CIRCULAR



The A. LIETZ CO., Distributors

632-34 Commerce St. San Francisco, California

The Hour of Prayer

THIS wonderfully comprehensive picture of the Great Sahara has been reproduced in sepia on heavy artist's proof board, size 7 x 18 inches, unfolded and ready for framing. Only a limited edition being possible, your order should be sent in ***at once.*** Price, postpaid, 50 cents.

Dept. H, National Geographic Magazine,
16th and M Sts., Washington, D. C.

"Geographic readers may depend upon the integrity of our advertisers."

ITALIAN CASTLES AND COUNTRY SEATS

By TRYPHOSA BATES BATCHELLER. Royal 8vo, with 4 Photogravures, 4 Plates in Color, and 80 Half-tone Plates. Boxed, $5.00 *net; express extra.*

The author of "Glimpses of Italian Court Life" gives us now an intimate portrayal of the home life of the Italian aristocracy in their ancestral country seats. The elaborate illustrations include interior scenes and some of the famed Italian gardens.

MY ADVENTURES IN THE CONGO

By MARGUERITE ROBY. With Numerous Illustrations. 8vo, $3.50 *net.*

The account of the author's hazardous six months' journey through darkest Africa, with numerous photographic illustrations and Map, casts an entirely new light on the vexed question of Belgian rule in the Congo.

PERU OF THE TWENTIETH CENTURY

By PERCY F. MARTIN, author of "Mexico of the 20th Century," "Salvador of the 20th Century," etc. With Many Illustrations and a Map. 8vo, $4.20 *net.*

UNEXPLORED SPAIN

By ABEL CHAPMAN, author of "Wild Spain," "Wild Norway," etc.; and WALTER J. BUCK. 209 Illustrations. Royal 8vo, Decorative Cover, $6.00 *net.*

Largely an exposition of the wild life of one of the wildest of European countries.

ROUGHING IT IN SOUTHERN INDIA

By MRS. M. A. HANDLEY. With Numerous Illustrations. 8vo, $3.50 *net.*

Full Descriptions of any of these books will be mailed upon request.

LONGMANS, GREEN, & CO. Fourth Ave. and 30th St., N.Y.

PANORAMA OF THE CANADIAN ROCKIES

THE MOST WONDERFUL MOUNTAIN PICTURE EVER MADE

¶Unfolded Copies in heavy Art Mat Board, ready for framing or to be used as a frieze. Size, nine feet long by nine inches high.

Limited Edition

Postpaid, Fifty cents

Department H
NATIONAL GEOGRAPHIC MAGAZINE
Sixteenth and M Streets N. W.
WASHINGTON, D. C.

Most Pleasing and Unusual Gift Articles

From Oriental Lands

Displayed in the Greatest Profusion at Vantine's

The Oriental works from no set pattern. The products of the East as presented by Vantine are individual, exclusive, unique, and artistic.

Gift articles to be found **nowhere else**; they cannot be measured by price. They have an individuality which will express your careful thought in choosing.

You are cordially invited to visit this display and make a personal selection. If this is impossible, send for our new book, "Gifts from the Far East," which illustrates over two hundred moderately priced articles; sent free on request.

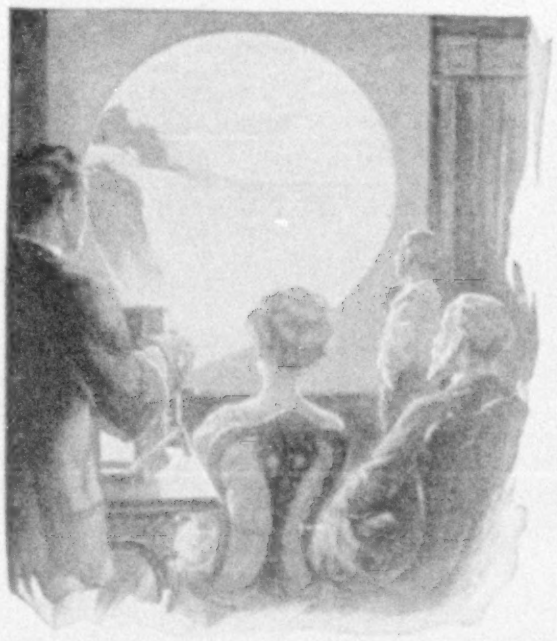
Vantine's

The Oriental Store

Broadway bet. 18th and 19th Sts., New York City
Also Boston and Philadelphia

Oriental Rugs	Oriental Perfumes
Drapery and	Ivories, Bronzes
Wall Fabrics	Porcelains, Teas
Dress Silks	Oriental Jewelry

"Mention the Geographic—It identifies you."



SHOW YOUR FRIENDS
Your Summer Successes

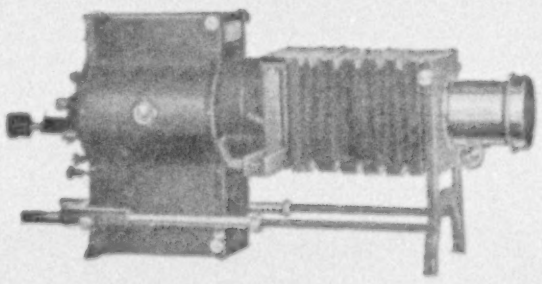
Doubtless you have many pictures taken this summer of which you are specially proud—pictures taken on dark days or under difficult conditions—speed pictures or some unusually fine portrait or landscape work. Make lantern slides of them and show them on the screen to your friends. Every detail of the original will show up clear, brilliant, and sharp if you use a

Bausch and Lomb Balopticon

Our Model C Balopticon is a perfect projection lantern. It is adaptable to many forms of entertainment and is so simply and durably constructed that it will last a lifetime; and it can be arranged to project opaque pictures, photos, drawings, post-cards, and the like.

Send for descriptive booklet, 22D.

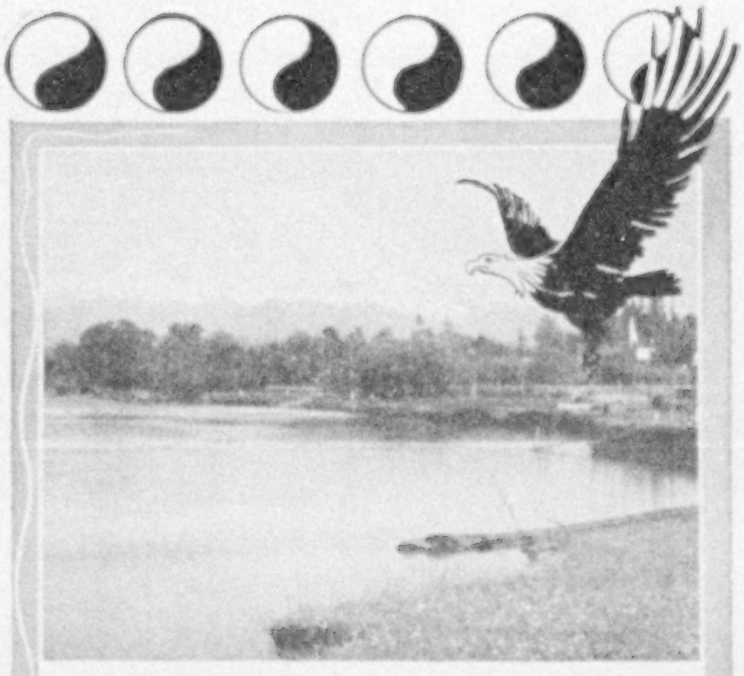
Our new booklet has just been prepared and contains complete information about the Balopticon and its many uses. Send for a free copy today.



Our name, backed by over half a century of experience, is on all our products—lenses, microscopes, field glasses, projection apparatus, engineering and other scientific instruments.

Bausch & Lomb Optical Co.

NEW YORK WASHINGTON CHICAGO SAN FRANCISCO
LONDON ROCHESTER, N.Y. FRANKFORT



Mt. Rainier-Tacoma, 14,363 Feet High

To or From

California

Double the enjoyment of your outing by traveling the trail of Lewis & Clark through the

Storied Northwest

See this Land of Fruit and Farms---Land of a thousand Scenic Surprises. See Glacial Peaks that vie with the Alps---Vineyards like those of Sunny France---Rivers that rival the Rhine.

See America First

Ride on the only exclusively-first-class Sleeping, Observation and Dining Car train to and from the North Pacific Coast:

'North Coast Limited'

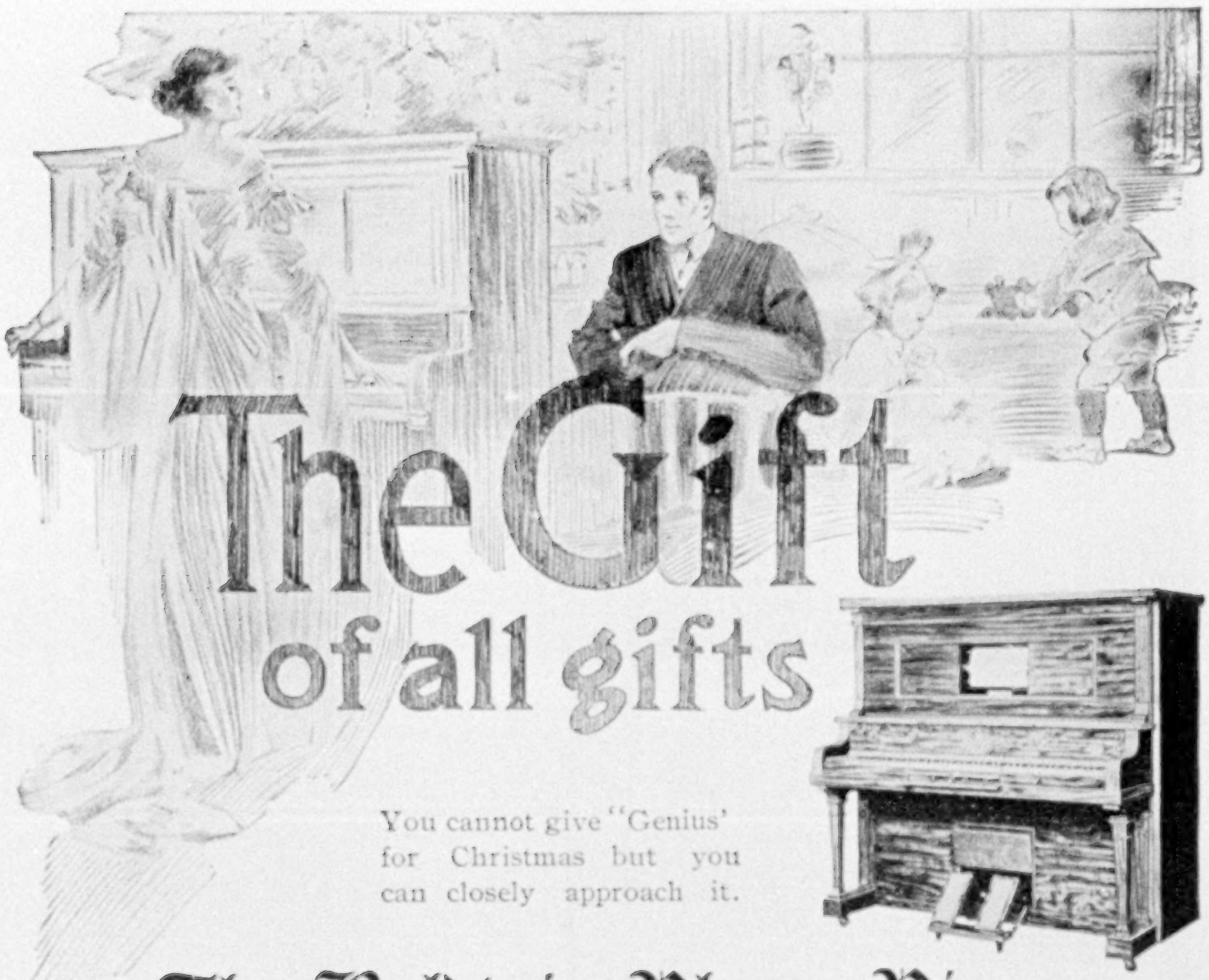
Write for "Eastward Through the Storied Northwest" and other booklets of trip and trains. Address

A. M. CLELAND
General Passenger Agent
ST. PAUL, MINN.

Northern Pacific Ry

Only line to Gardiner Gateway, OFFICIAL Yellowstone Park entrance.

"Geographic readers may depend upon the integrity of our advertisers."



The Gift of all gifts

You cannot give "Genius" for Christmas but you can closely approach it.

The Baldwin Player-Piano

offers two-thirds of genius's equipment: Suppleness of execution with the power to produce musical effects artistically.

The other third is personality.

It invites you to express the soul and color in music as *you* feel them. It emancipates you from mechanical tyranny, permitting spontaneous and independent effects of beauty wholly new to player music-making.

"In playing the Baldwin Player-Piano," said a famous pianist, "one *really does* share the artist's sensation of 'doing it all himself.'"

"THE BALDWIN PLAYER-PIANO"—this book sent on request.

The Baldwin Company

CINCINNATI
142 West Fourth Street

New York
8 E. 34th Street

Chicago
323 So. Wabash Ave.

St. Louis
1111 Olive Street

San Francisco
310 Sutter Street

Indianapolis
18 N. Penn'a St.

Louisville
425 S. Fourth Ave.

Denver
1626 California St.

"Mention the Geographic—It identifies you."

West Indies

BERMUDA—CUBA JAMAICA—PANAMA

THE AMERICAN RIVIERA

Equal scenic beauties and more delightful climatic conditions than the Mediterranean resorts, and right in America's front yard.

Bermuda Where the Sun Is Always Shining

Lowest rates that ever prevailed by the palatial Transatlantic liner "Tagus," 5,545 tons.

See the Canal Before the Water Goes in **Panama**

Guides appointed by the Gov't Commission show R. M. S. P. tourists over the Isthmus.

Cuba Quaint Ancient Cities and Impressive Ruins

Still retaining its Spanish splendor and fascinations, but fast assuming modern ways.

Garden of Eden in the Caribbean **Jamaica**

Declared by travelers to be more beautiful in its tropical splendor than any other country.

The West Indies Fleet

Thames, 5,621 Tons Clyde, 5,618 Tons
Oruba, 5,971 Tons Orotava, 5,980 Tons

THE ROYAL MAIL STEAM PACKET CO.

Sanderson & Son, Gen. Agts. 22 State St., N. Y.
15 South La Salle St., Chicago, Ill.
W. H. Eaves, 200 Washington St., Boston
also all Local Agents

INDEPENDENT

AROUND THE WORLD TRIPS

TICKETS GOOD FOR TWO YEARS

$618.00

NORTH GERMAN LLOYD

ITALY — EGYPT — INDIA

MODERN TWIN SCREW STEAMERS; LUXURIOUS SURROUNDINGS; UNEXCELLED CUISINE; LIGHT, AIRY CABINS. UNUSUALLY LOW RATES TO AUSTRALIA, NEW ZEALAND AND TASMANIA, VIA EUROPE AND SUEZ CANAL.

Write for "Around-the-World" Booklet K

'Travelers' checks good all over the world.

OELRICHS & CO., General Agents, 5 BROADWAY, N.Y.

H. CLAUSSENIUS & CO. CHICAGO — ALLOWAY & CHAMPION WINNIPEG — H. CAPELLE SAN FRANCISCO

Cunard Winter Cruises

ITALY—RIVIERA—EGYPT

Madeira, Gibraltar, Algiers, Villefranche or Genoa, Naples, Alexandria, and Fiume

†CARMANIA 20,000 Tons LACONIA 18,000 Tons
FRANCONIA 18,150 Tons CARONIA 20,000 Tons

† Largest Turbine Steamer Ever Sent to the Mediterranean.

Jan. 6, Jan. 20, Feb. 3, Feb. 20, Mar. 2

Feb. 20th and March 20 Sailings omit call at Fiume.

Special Fall Sailing from New York to the Mediterranean—S.S. IVERNIA, November 30

A LA CARTE service without charge. Stopovers permitted.

FOR PARTICULARS, ETC., APPLY TO DEPT. Y

THE CUNARD STEAMSHIP CO., Ltd.

New York, Boston, Chicago, Minneapolis, Philadelphia, St. Louis, San Francisco, Montreal, Toronto, and Winnipeg or Local Agents.

SOUTH AMERICA

Semi-Annual Grand Tour leaves New York Jan. 27.

AROUND THE WORLD

Small select party leaves Jan. 6. Travel de Luxe.

TOURS TO THE ORIENT

Select limited Tours to Egypt, Palestine, Turkey, Greece, etc., leave Jan. 6, 10, 20, 24; Feb. 3, 14, 20, 21; March 2. Itineraries are varied and inclusive; every detail the best.

EGYPT AND THE NILE

Cook's luxurious Nile steamers leave Cairo every few days during the season for the First and Second Cataracts, the Sudan, etc.; also elegant private steamers and dahabeahs for families and private parties.

Illustrated booklets for each series

THOS. COOK & SON

NEW YORK: 245 Broadway, 264 Fifth Ave.

BOSTON PHILADELPHIA CHICAGO
SAN FRANCISCO LOS ANGELES
MONTREAL, TORONTO

Cook's Travelers' Cheques are good all over the World

TRAVEL WITH DUNNING

EGYPT, PALESTINE, TURKEY, GREECE
February 3 and 20

Four unsurpassed tours with maximum time on land. Efficient American leadership. Dr. A. E. Dunning, Editor-in-Chief of "Congregationalist," special lecturer. Thirteenth season. Other tours March 2, April 20, and June 15.

EUROPEAN TOURS

in Spring and Summer, covering all countries. Wide range of prices. Write for advance booklet.

Motor Tours.

H. W. DUNNING & CO.,
109 Congregational Bldg., BOSTON, MASS.

"Geographic readers may depend upon the integrity of our advertisers."

A Choice of Pleasure Trips For Your Winter Vacation

THREE YACHTING CRUISES

REPEATING PREVIOUS UNPRECEDENTED SUCCESSES

TO THE *Exquisite*

WEST INDIES, SOUTH AMERICA AND PANAMA CANAL

BY THE AMERICAN LINE'S

Twin Screw S. S. "NEW YORK" 10,800 Tons

LONG VOYAGES 31 Days Each — JAN. 20 and FEB. 24

$150 Upward

EASTER SHORT CRUISE, MARCH 30

18 Days—$85 and Upward

CUBA—JAMAICA—ST. THOMAS
PORTO RICO—BERMUDA

Ask for Programs and Details

PLEASURE CRUISE DEPT., 9 BROADWAY NEW YORK

Offices and Agencies Everywhere

WINTER VOYAGES DE LUXE TO THE *Superb* MEDITERRANEAN

BY THE WHITE STAR LINE'S

Mammoth Twin-Screw S. S. "ADRIATIC" AND "CEDRIC"

The Largest British Mediterranean Steamers

SAILING FROM NEW YORK

DEC. 2 — JAN. 10 — JAN. 24
FEB. 21 — MARCH 6

Also Regular Sailings from New York and Boston to ITALY by the Twin-Screw Steamships

"Cretic," "Canopic," and "Romanic"

Illustrated Booklets and Complete Itineraries

WHITE STAR LINE, 9 BROADWAY NEW YORK

Offices and Agencies Everywhere

Delightful Winter Cruises

Annual Event Around the World

by the

Cruising Steamship, "Victoria Luise"

November, 1912, and February, 1913

A Few Desirable Staterooms available on second cruise on S. S. Cleveland from San Francisco, February 6, 1912.

Grand Cruise to the Orient from New York January 30, 1912, to Madeira, Spain, the Mediterranean, and the Orient. 78 days, $325 and upward. Made by the **Victoria Luise** (16,500 tons); has all modern features.

5 Cruises to the West Indies During January, February, and March. From 16 to 28 days duration, costing from $85 up.

To South America by the S. S. Blüecher (12,500 tons), leaving New York January 20, 1912; making all important ports, with interesting Side Trips. Duration, 80 days; cost, $350 up.

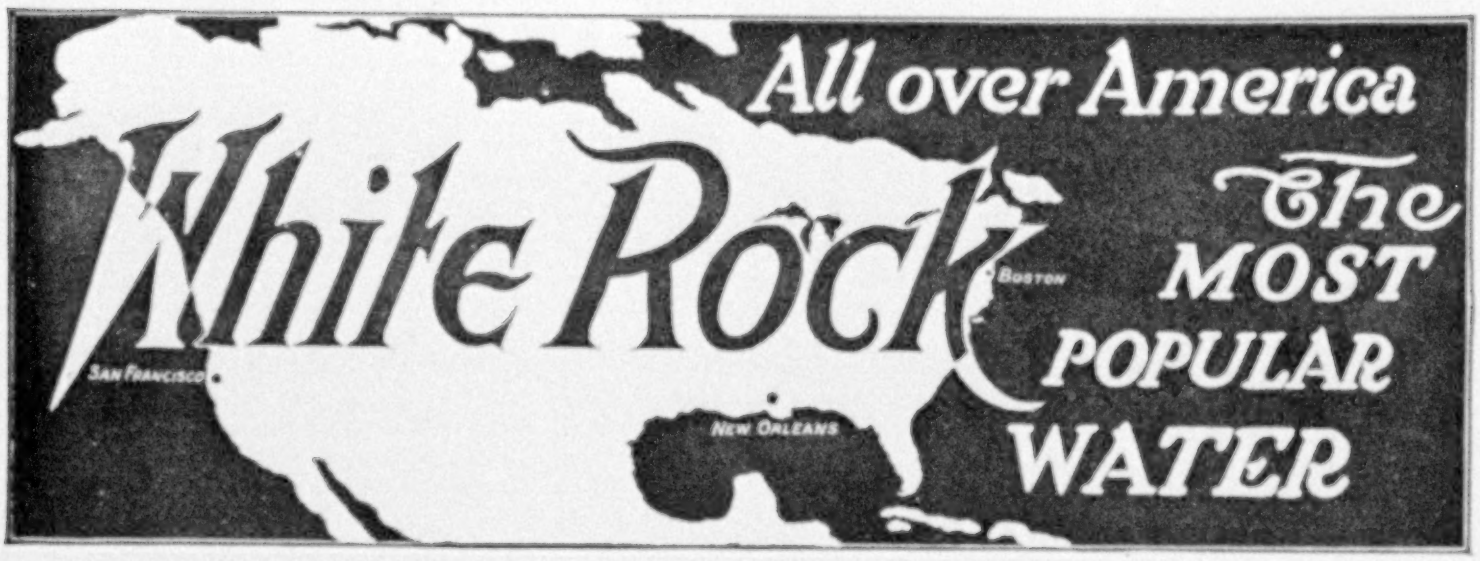
Special Trips to **Italy and Egypt** from New York, February 14, 1912, calling at all ports to or from Port Said, $165. From other ports, $115 and up.

Send for booklet giving full information, etc.

HAMBURG-AMERICAN LINE, 41-45 Broadway, New York

Boston Philadelphia Pittsburgh Chicago St. Louis San Francisco

XUM



SPRATT'S

Meat Fibrine and Cod Liver Oil

Were the only DOG CAKES used by Lieutenant Shackleton on his successful dash to the South Pole.

All recent Arctic and Antarctic expeditions have carried SPRATT'S BISCUITS—an absolute proof of their sustaining value for vigorous work.

Send stamp for "Dog Culture," which contains much valuable information.

SPRATT'S PATENT, Ltd.

Factories and Chief Offices at Newark, N. J.

Depots at San Francisco, St. Louis, Chicago, Cleveland, and Montreal, Canada.

The most magnificent place in America, embracing every feature to give perfect service

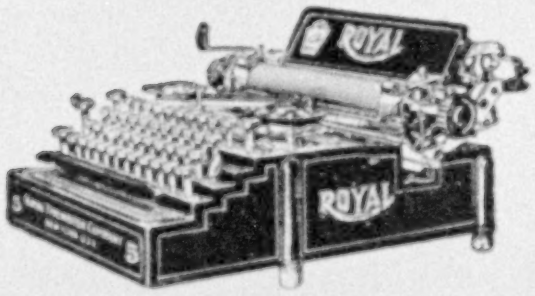
LOUIS MARTIN'S

Broadway, at 42d St. **New York** 7th Avenue, at 42d St.

The Restaurant with the Atmosphere

Lunch, Dinner, and Supper a la Carte
Afternoon Teas Table d'Hote
Dinner, $1.50, from 6 to 9 P. M.

ORCHESTRAS



Used Extensively by the U. S. Government

The ROYAL STANDARD TYPEWRITER

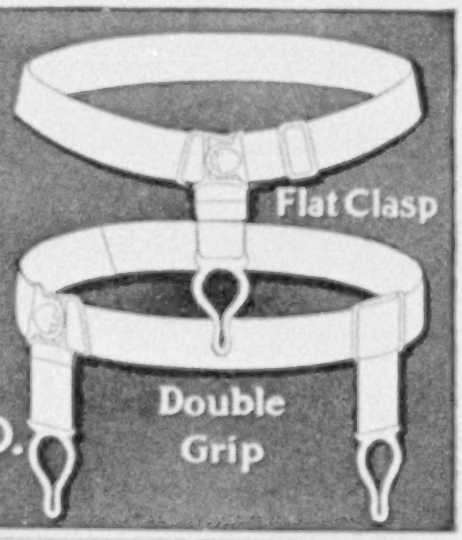
The simplest, strongest, and most practical typewriter made

PRICE, WITH TABULATOR **$75.00** Without Tabulator $65.00

ROYAL TYPEWRITER CO., Royal Typewriter Building, New York
1317 New York Ave., Washington, D.C.

NO METAL TOUCHES THE SKIN

Brighton Garters



25 AND 50¢

AT THE BEST SHOPS - OR BY MAIL

PIONEER SUSPENDER CO.
PHILADELPHIA

Erected by Harrison Granite Co., Forest Hills Cemetery, Boston, Mass.

DURING the fifty-four years' experience enjoyed by this house, our product has been recognized as a standard of excellence, both in public and private memorials. From our Booklet of Illustrated Types one may obtain suggestions of fitting memorials. We would be pleased to mail it upon request. Work erected throughout the Union.

HARRISON GRANITE COMPANY

Room 1311-A, 200 Fifth Ave., New York City

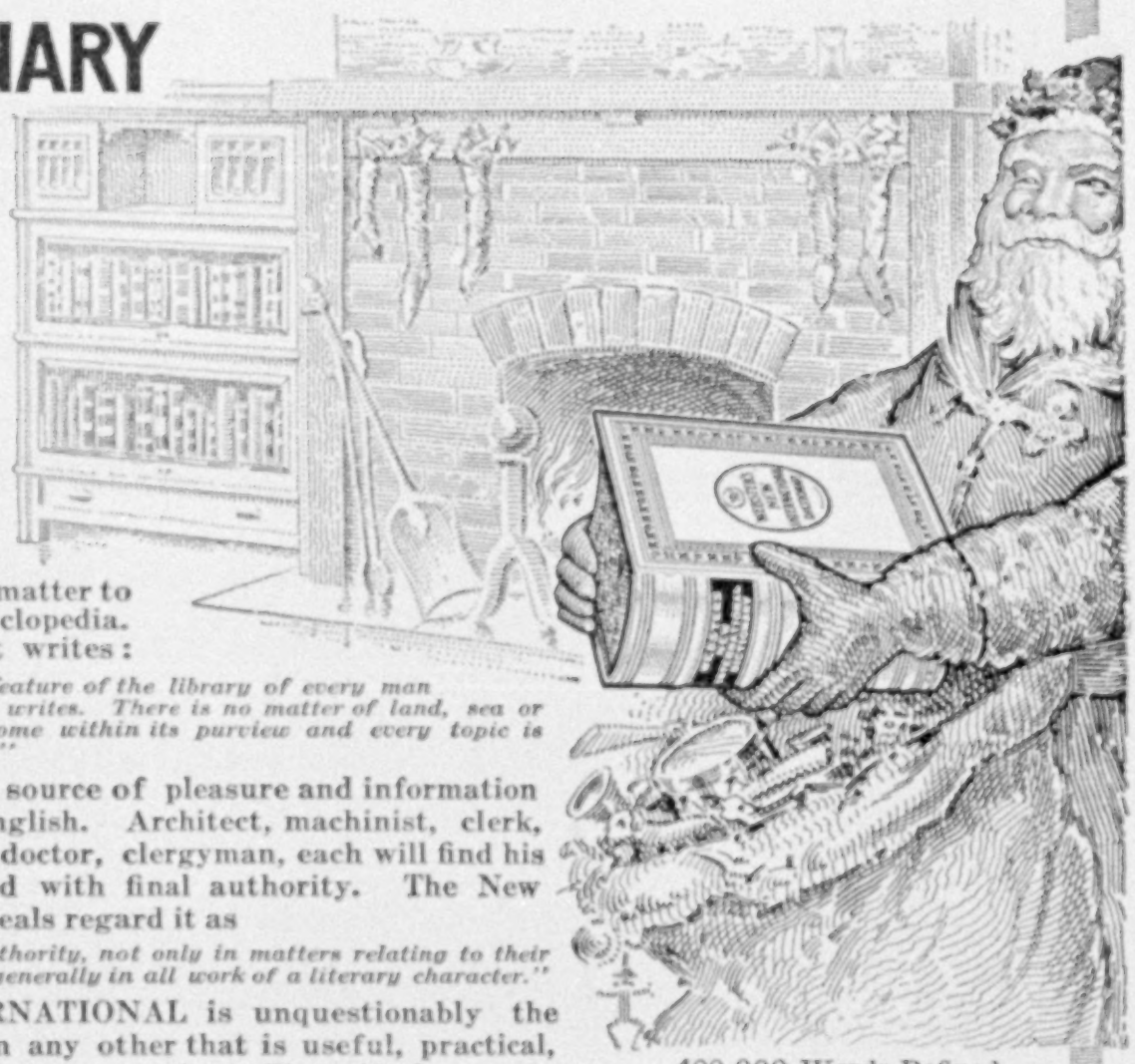
Resident Representatives:

H. Lawson, 4927 Osage Ave., Philadelphia, Pa.; H. L. Davis, 1206 East Adams St., Syracuse, N. Y.; George Simpson, 4 Buhl Block, Detroit, Mich.; R. S. Morrison, 801 Baltimore Bldg., Chicago, Ill. Works: BARRE, VT.

"Geographic readers may depend upon the integrity of our advertisers."

"Here is A Gift That All Will Enjoy"

WEBSTER'S NEW INTERNATIONAL DICTIONARY



THE MERRIAM WEBSTER

It is a GIFT to be treasured, admired, and used by *all* members of the family. This NEW CREATION is far more than a single volume,—more than a single gift. It is truly a library in *one* book, equivalent in type matter to a 15 volume encyclopedia. Dr. C. H. Parkhurst writes:

"An indispensable feature of the library of every man who either reads or writes. There is no matter of land, sea or sky that does not come within its purview and every topic is handled by a master."

This new work is a source of pleasure and information to all users of English. Architect, machinist, clerk, merchant, banker, doctor, clergyman, each will find his questions answered with final authority. The New York Court of Appeals regard it as

"An unsurpassed authority, not only in matters relating to their particular work but generally in all work of a literary character."

The NEW INTERNATIONAL is unquestionably the *one* gift more than any other that is useful, practical, authoritative, lasting, attractive. The gift longest to be remembered after the holiday season has passed.

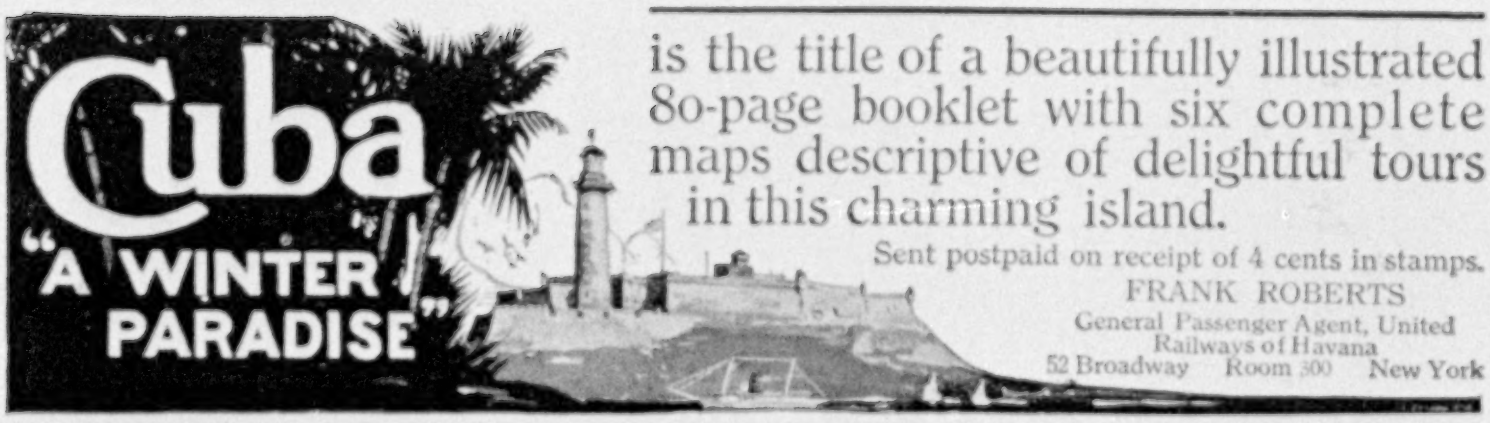
400,000 Words Defined.
2700 Pages. 6000 Illustrations.
The only Dictionary with the
New Divided Page.

WRITE for specimens of the new divided page, illustrations, etc.
Mention Nat. Geo. Mag. and receive FREE a set of pocket maps.

G. & C. MERRIAM CO., SPRINGFIELD, MASS.

Name .....

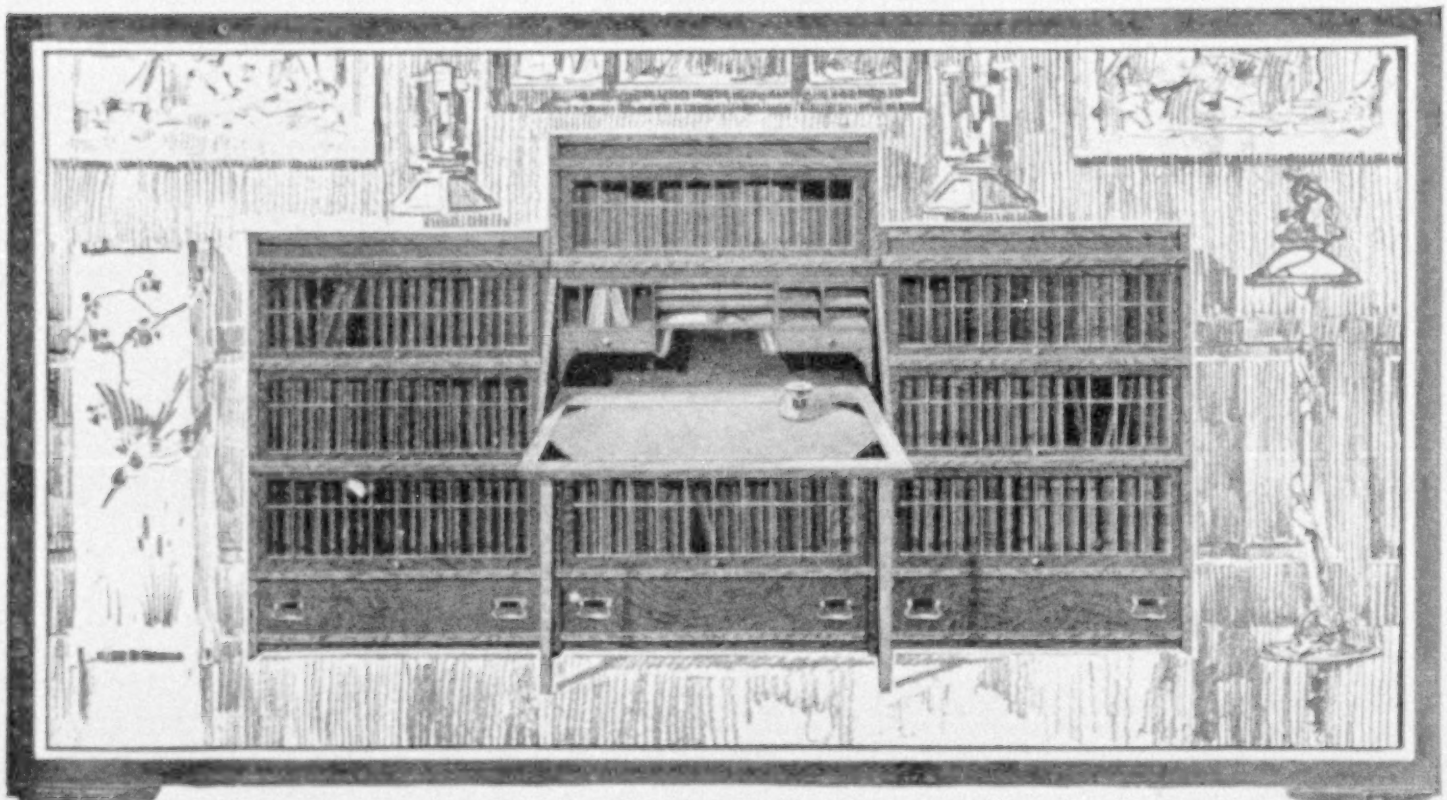
Address .....



is the title of a beautifully illustrated 80-page booklet with six complete maps descriptive of delightful tours in this charming island.

Sent postpaid on receipt of 4 cents in stamps.

FRANK ROBERTS
General Passenger Agent, United Railways of Havana
52 Broadway Room 500 New York



When you select a bookcase that combines the features of convenience, beauty and protection of books, you will decide upon one of the many styles in

Globe-Wernicke Bookcases

Rare editions and delicate bindings—as well as valuable books of all kinds should be stored in their dust-proof non-collapsible units, because in case of fire each unit can be quickly removed to a place of safety with their contents intact.

Globe-Wernicke Units are made in many different styles and finishes to harmonize with appropriate interiors for home, club and public libraries.

Carried in stock by nearly 1,500 agents, but where not represented, we ship on approval, freight paid.

Complete catalogue, lavishly illustrated in colors, also lists of **"The World's Best Books"** as compiled by such eminent authorities as Hamilton W. Mabie, John Ruskin, Cannon Farrar, Dr. Eliot, Sir John Lubbock—mailed on request.

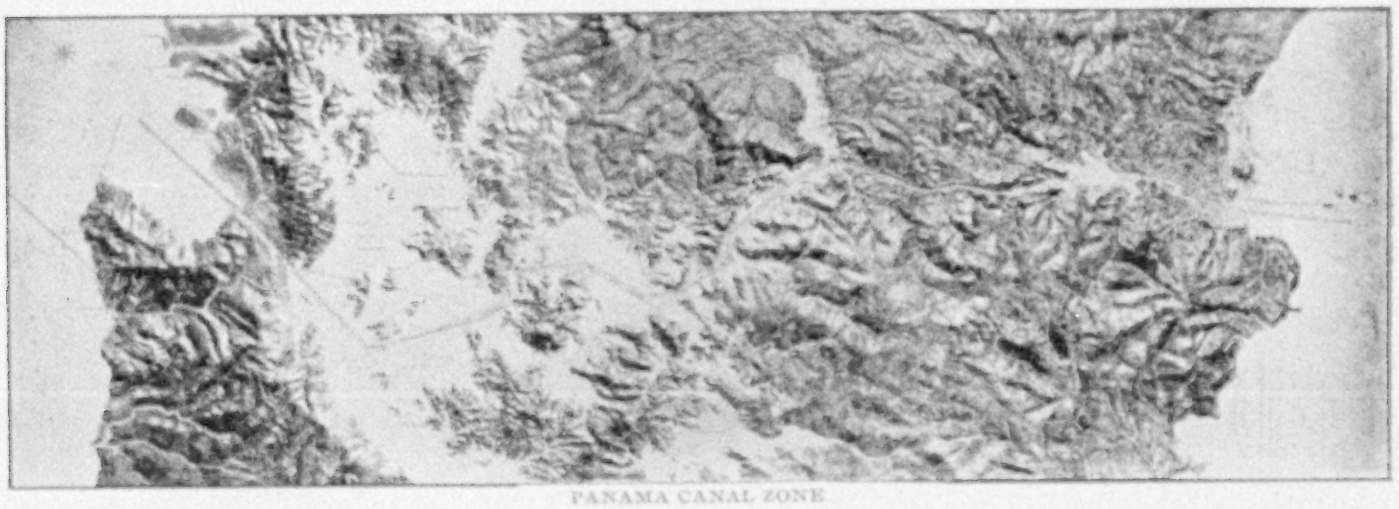
The Globe-Wernicke Co., Cincinnati

Branch Stores: New York, 380-382 Broadway
Philadelphia, 1012-1014 Chestnut St. Boston, 91-93 Federal Street
Chicago, 231-235 So. Wabash Avenue Washington, 1218-1220 F St., N. W.

"Geographic readers may depend upon the integrity of our advertisers."

HOWELL'S RELIEF MAPS

ASSURE ACCURACY AND INSTANT CONCEPTION



PANAMA CANAL ZONE

For an intelligent and profitable study or even a working knowledge of geography, it is being rapidly realized that a good relief map is indispensable, since no printed map can illustrate the salient features of the earth with such clearness, accuracy, or completeness as do Howell's naturalistic land models.

Why not, therefore, have for your office, library, or home, as well as for school, college, and university, Howell's Relief Maps, which convey to you *at a glance* the true outlines of the continents, brought out in bold relief, showing the boundaries and capitals of the different countries, their formation and location, colored and lettered, and, above all, absolutely *accurate*. The cost of relief maps is not excessive, as supposed.

Besides our great variety of relief maps, we are prepared to compile relief maps and models showing landscape gardening, municipal improvements, playgrounds, etc., in any part of the country, from data furnished. Think of the importance of being able to see every detail of your project as it will be, with proper elevations, buildings, etc., built to exact scale, as a permanent record.

"There is no question as to the great value of Howell's Relief Maps. They should be universally used."
Dr. F. A. LUCAS, *Director, Am. Museum of Natural History, New York City.*

Washington School Collection of Minerals

Forty different minerals, put in strong cloth-covered cases, and accompanied with model text books, for only $2.00. 40 varieties of rocks, with duplicate fragments, $2.00. Send for our interesting circular.

We will send you upon request an illustrated catalogue of Howell's Relief Maps and Models. Write today.

HOWELL'S MICROCOSM ... 612 17TH STREET N.W., WASHINGTON, D. C.

Jaeger SANITARY GOODS

AUTOMOBILISTS

With the approach of colder weather you are peculiarly liable to chill. This you can avoid by wearing a Jaeger Automobile Coat of pure Camel-Hair. You will make protection doubly assured by wearing also the famous Jaeger Underwear.

Particulars and Samples on request.

Dr. Jaeger's S. W. S. Co.'s Own Stores:
New York, 306 5th Ave., 22 Maiden Lane; Brooklyn, 504 Fulton St.; Boston, 228 Boylston St.; Philadelphia, 1516 Chestnut St.; Chicago, 126 N. State St. *Agents in all principal cities.*

TECO

No. 375—10in. high—$4 No. 377—13in. high—$10

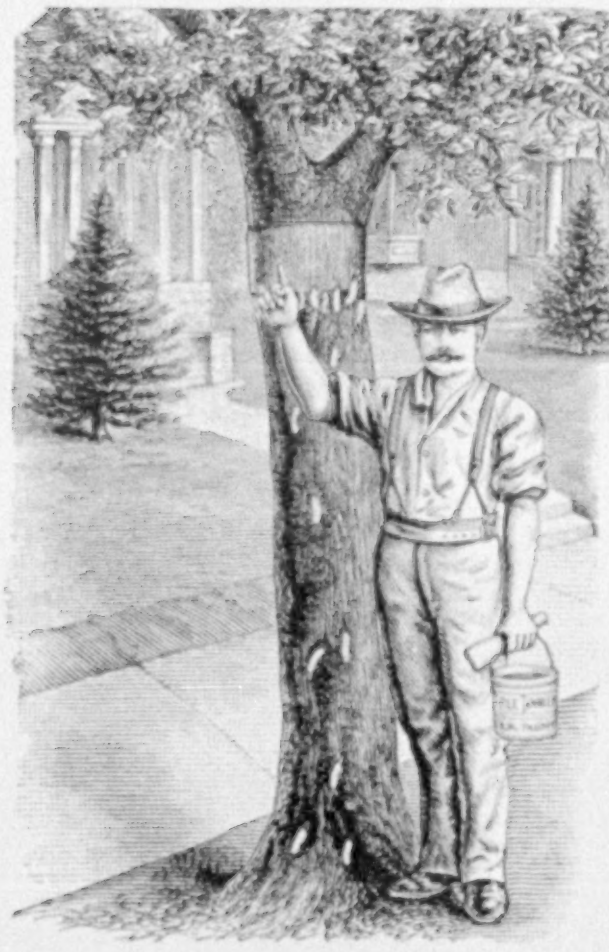
NEW SHAPES as well NEW COLORS as

Everybody who ever gives anybody anything—or who cares for *home*—is glad to learn of the *NEW THINGS* in

TECO POTTERY

It is now made in *Browns, Blues, Yellows* and *Greys*, as well as the classic "*Teco Green*."
Ask your art dealer or *write* for NEW TECO BOOK.
The GATES POTTERIES 224 Gates Avenue Terra Cotta, Ill.

Band Your Trees With Tree Tanglefoot



A harmless sticky substance. Applied directly to tree trunks. Remains effective (rain or shine, warm or cool) three months and longer fully exposed to weather. One pound makes 8 to 9 lineal feet of band. No apparatus required; easily applied with wooden paddle. No mixing, always ready for use. Especially recommended against tussock, gypsy or brown-tail moth caterpillars, bag-worms, canker-worms and climbing cut-worms, although equally effective against any climbing pest. Don't wait until you see the insects—band your trees early.

PRICE — 1-lb. cans, 30 cts.; 3-lb. cans, 85 cts.; 10-lb. cans, $2.65; 20-lb. cans, $4.80

SEND FOR BOOKLET

The O. & W. THUM COMPANY
GRAND RAPIDS, MICHIGAN

Manufacturers of Tanglefoot Fly-Paper and Tree Tanglefoot

WHEN YOU GO WEST

TAKE THE

NEW WAY

THROUGH THE

FEATHER RIVER CANYON

VIA THE

Denver & Rio Grande
and
Western Pacific

A World's Wonderway

For information and sleeping-car reservations, ask your Local Agent, or address

E. L. LOMAX, Passenger Traffic Manager
G. F. HERR, Asst. Gen'l Passenger Agent
Western Pacific Railway

SAN FRANCISCO, CALIFORNIA

PURE LIGHT SOFT HEALING

Buckhead Spring Water

Buckhead Springs, Virginia.
Chesterfield County.

Packed only in New, Clean Bottles, Sealed at the Springs

$4.00 per case, 12 half-gallons, through your dealer, or direct to you.

HIGGINS'

DRAWING INKS
ETERNAL WRITING INK
ENGROSSING INK
TAURINE MUCILAGE
PHOTO MOUNTER PASTE
DRAWING-BOARD PASTE
LIQUID PASTE
OFFICE PASTE
VEGETABLE GLUE, Etc.

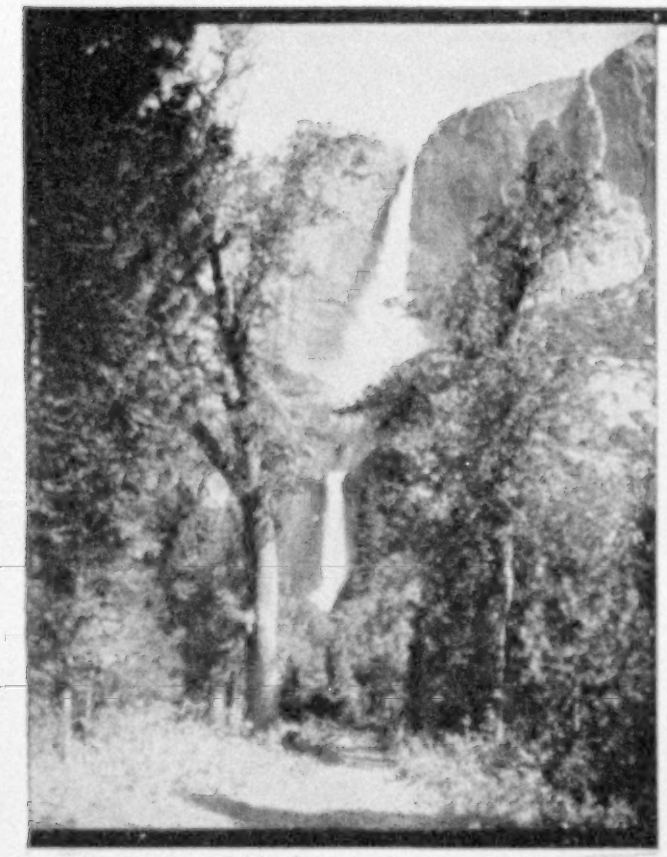
Are the finest and best Inks and Adhesives

Emancipate yourself from the use of corrosive and ill-smelling inks and adhesives and adopt the **Higgins Inks and Adhesives.** They will be a revelation to you; they are so sweet, clean, and well put up, and withal so efficient.

At Dealers Generally

CHAS. M. HIGGINS & CO., Mfrs.
Branches: Chicago, London.
271 Ninth Street, Brooklyn, N. Y.

"Geographic readers may depend upon the integrity of our advertisers."



Yosemite National Park

IN WINTER.

A SCENE OF MAGIC BEAUTY

Snow Capped Mountains Frozen Waterfalls
Flowing Streams Beneath Tunnels of Snow
Sleighing, Skating, Tobogganing

And This in the Very Bosom of

Sunshine, Fruit and Flowers

A Veritable Fairyland is

California

See That Your Tickets Read

Southern Pacific

Sunset Route

Traversing A Wonderful Country

New Orleans to San Francisco

Superior Equipment

Descriptive Literature on Request

L. H. Nutting, G. E. P. A., 1158 or 366 or 1 B'dway, New York

Yellowstone National Park

Comprises the greatest region of natural wonders in the world. Few have any idea of its stupendous grandeur.

Plan your vacation next Summer for a visit to the Park by way of the Western entrance, at Yellowstone Station, Wyoming.

Remember that side trips may be arranged to Denver and Salt Lake City—both famous as summer resorts.

You will enjoy your trip from the start by traveling via

UNION PACIFIC

Standard Road of the West

Protected by Electric Block Signals. Excellent Dining Cars on ***all*** Trains.

For literature and information relative to the Park, call on or address the nearest representative.

GERRIT FORT, P. T. M.,
B-824 Farnam Street, Omaha, Neb.

J. B. DEFRIEST, G. E. A.,
B-287 Broadway, New York.

W. G. NEIMYER, G. A.,
B-73 W. Jackson Boul., Chicago, Ill.

A. J. DUTCHER, G. A.,
B-315 N. Ninth Street, St. Louis, Mo.

JUDD AND DETWEILER, Inc.

PRINTERS

We make a specialty of Legal Printing—Briefs, Records, and Motions

This Magazine is from Our Presses

Out-of-town Work Solicited
Two Phones

Booklets, Catalogues, and Best Grade of Commercial Printing

420-422 ELEVENTH ST., WASHINGTON, D. C.

RECOMMENDATION FOR MEMBERSHIP

in the

National Geographic Society

The Membership Fee Includes Subscription to the National Geographic Magazine

DUES: Annual membership in U. S., $2.00; annual membership abroad, $3.00; Canada, $2.50; life membership, $50. Please make remittances payable to National Geographic Society, and if at a distance remit by N. Y. draft, postal or express order.

Please detach and fill in blank below and send to the Secretary

---

_____ 191

To the Secretary, National Geographic Society,
Sixteenth and M Streets Northwest,
Washington, D. C.:

I nominate _____

Address _____

_____

for membership in the Society.

_____

_____
(Write your address)

11-11

"Geographic readers may depend upon the integrity of our advertisers."

Superb New Lantern Slides

BEAUTIFUL SCENES FROM PALESTINE, EGYPT, AND ATHENS

These new Slides are from negatives made by our photographer on a recent trip. Also a new line of Slides on HOLLAND, BELGIUM, and IRELAND of the same superior grade.

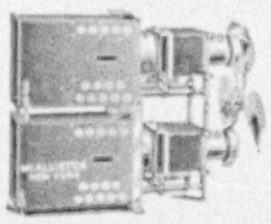
We carry an unlimited stock of Lantern Slides, covering every subject-matter for Amusement and Educational purposes, as well as for Lectures on Travel, Art, History, and Science.

Also countless Slides for Church and Sunday School for rental or purchase.

Over 150,000 Subjects to choose from

Stereopticon Projection Apparatus

A full line of Projection Apparatus of the most approved forms suitable for Home Entertainment, the Church, School, or Lecture Hall.



Send today for Catalogue of slides and apparatus.

T. H. McALLISTER CO.
Dept. H
49 Nassau St., New York
Established 1753

J. M. TROXELL

Dealer in

Braun's Carbon Prints

1 West 34th Street, New York
(Century Building)

Direct Reproductions of

Ancient and Modern Masterpieces

in the principal galleries of the world; also of the most celebrated

Architecture, Sculpture, and Views of Switzerland.

*Catalogue, with over 800 illustrations . . $0.50
*General Catalogue (French), not illustrated, 1.00

Illustrated Booklet No. 1 on Request

Pictures Framed and Shipped Everywhere

PRINTS IN COLORS
after the original paintings

*This sum will be deducted from purchase amounting to $10.

New Travel Books

FOUR MONTHS AFOOT IN SPAIN

By Harry A. Franck

Author of
"A Vagabond Journey Around the World"

Mr. Franck's first book, "A Vagabond Journey Around the World," has passed through five large editions, and is unquestionably one of the most popular travel books ever issued. Here is the story of the author's experience and adventures during four months afoot in Spain. Mr. Franck did not go penniless, but the slender sum which took him across the water and back kept him at all times close to native life. The new book is as delightful as the earlier one in its vivid descriptions and its unfailing sense of humor.

Sixty interesting illustrations from photographs. 8vo, 400 pages. Price, $2.00 net; postage, 16 cts.

THE MAN WHO LIKES MEXICO

By Wallace Gillpatrick

The next best thing to an actual trip through the land that has recently been in revolution is a reading of this book. It has all the charm that a good book of personal narrative should have, together with a bird's-eye view of the country geographically and historically; and the reader enters sympathetically into the adventures by the way, the rambles into odd corners, the romantic excursions looking for lost mines, and the intimate study of Mexico's social life. Mr. Gillpatrick says: "I was happy in Mexico because the people and the land were sunny."

Richly illustrated from photographs. 8vo, 400 pages. Price, $2.00 net; postage, 15 cents.

Published by

The Century Co., New York

PERU—The Land of the Incas

OF all the lands comprised in the vast South American continent, there is none more richly endowed by Nature with everything that is magnificent to the eye of the traveler, none whose history is more fascinating, whose relics of a former age are more potent to cast a spell over the imagination, than Peru. It was here that, in the fulness of time, a handful of daring Spanish adventurers, emboldened by pride of race and lust of gold, subjugated an entire and almost unknown nation, planted the Cross over the ruined temples of the Sun, and turned the current of history. Such a land cannot but offer irresistible attractions to the modern tourist, and we will be glad to furnish information of a general character to prospective visitors, and to convey some idea of the nature of the country.

Scenic Grandeur Unparalleled

Nowhere else in the universe had Nature laid such colossal difficulties in the way; never were difficulties more stoutly combated and overcome. Now cutting through gigantic masses of rock, now scaling precipitous heights, now crossing abysmal ravines and roaring torrents, the great military thoroughfares constructed in Peru under the Inca dynasty challenged comparison with the proudest achievements of the Old World.

Splendid Railroad Equipment

Peru is still the country of wonderful highways, but they are today roads of steel, and the engineering triumphs which so amazed the discoverers of the country are eclipsed by the modern railway man. All of them are well constructed roads, over which the passenger is borne in comfortable coaches as smoothly and safely as if he were traveling on one of the leading trunk lines of Great Britain or the United States.

How To Get There

A tempting variety of steamship routes is offered from Europe to Callao, the principal port of Peru. A regular fortnightly service of the fine steamers of the Royal Mail Steamship Company leaves Liverpool for all the principal Brazilian, Chilian, and Peruvian ports as far as Callao, and a more interesting run it would be difficult to imagine. At Montevideo the passenger may, instead of continuing the trip South to Punta Arenas and through the picturesque Straits of Magellan, elect to make a short stay in Buenos Aires, the Paris of South America, and proceed overland to Valparaiso by the Transandine Railway. The quickest route, however, is that by the Atlantic steamers from New York, whence vessels sail to Colon, train then being taken to Panama, the starting point of the West Coast steamers, the whole journey being usually completed within about three weeks. An alternative to this trip, again, is available by the Royal Mail boats to Colon via Barbados and Trinidad.

The Peruvian Corporation, Ltd.

THE CENTRAL RAILWAY OF PERU, Ltd.
THE SOUTHERN RAILWAY OF PERU, Ltd.
NAVIGATION LAKE TITICACA AND RIVER DESAGUADERO.
THE GUAQUI & LA PAZ RAILWAY.
THE PAITA TO PIURA RAILWAY, Ltd.
THE TRUJILLO RAILWAY, Ltd.
THE PACASMAYO & GUADALUPE RAILWAY, Ltd.
THE CHIMBOTE RAILWAY.
THE PISCO TO ICA RAILWAY.
THE ILO TO MOQUEGUA RAILWAY.

Full information regarding sailings, fares, etc., may be obtained upon application to the Tourist Agencies, to the London Office of the Corporation, 43 Threadneedle Street, E. C., or to the Representative, Lima, Peru.

"Geographic readers may depend upon the integrity of our advertisers."

Wanamaker's

Christmas Catalog is Ready

Wonderful Christmas merchandise, and 1000 toys and games. Let the kiddies see the pictures and you'll know instantly what will please them most.

Over 50 pages of our General Winter Catalog are devoted to Christmas suggestions. Ask for that, too.

Both are free on request.

Write us today: "Send Christmas Catalog No. 21."

JOHN WANAMAKER, New York

RAD-BRIDGE

Registered at Pat. Office LONDON: WASHINGTON: OTTAWA.

BRIDGE WHIST ACCESSORIES

"The Standard of the Bridge World"

CLUB LINEN PLAYING CARDS. Design of back fine hemstitched linen. Pat. Sept. 24-'07. Red, blue, brown, and green. 25c. pack. Gold edge, 35c. Samples.

SILK VELOUR PLAYING CARDS. Pat. Apr. 6-'09. Same quality, size, colors, and price as our famous club linen card, only difference design of back. Samples.

BASKET WEAVE PLAYING CARDS. Pat. Mch. 15-'10. The latest design of back. Same in all other respects as our famous Club Linen and Velour Cards. You can now buy one dozen "Rad-Bridge" standard playing cards with every pack in the carton different. Plain, by the dozen, $2.75. Gold edge, by the dozen, $4.60. "Rad-Bridge" cards are ideal for Bridge, but there is no better 25c. card for any game.

LIFE'S BRIDGE PAD. 26 Cupid pictures by "Life" artists in pad of 50 sheets. Space for more than 150 rubbers. 25c. per pad. $2.50 per dozen. Samples.

"RAD-BRIDGE," THE STERLING MARK on Bridge accessories the world over. Illustrated catalog free. Ten cents in stamps (less than cost) secures our wallet of samples in addition.

"RAD-BRIDGE" GOODS ARE SOLD by first-class dealers everywhere, or will be sent direct, carriage prepaid, on receipt of price.

Dept. G, RADCLIFFE & CO.,
144 Pearl Street New York

Get Better Results with Your Camera

War photographers, noted amateurs who photograph wild animals, and professionals, who must have perfect results even under difficulties, get their pictures with Goerz Lenses. We will tell you how

GOERZ LENSES

on the very camera you now own will give you expert results. Goerz Lenses are universally acknowledged by men who know to be the most wonderfully accurate lenses made.

Write for Book on Lenses and Cameras

Free to any one interested in good photography

C. P. GOERZ AMERICAN OPTICAL CO.
319 A, East 34th Street, New York

All the plates used in
The NATIONAL GEOGRAPHIC MAGAZINE
are made by
The GILL Engraving Company
140 Fifth Avenue New York

"I am learning to speak French like a native, because I am learning directly from a native Frenchman, who talks to me through the Language-Phone. My teacher speaks pure, polished French, and ungrudgingly repeats it again and again—until I also can speak it fluently, and understand it when heard. The ease with which I can converse in my newly acquired language surprises both myself and my friends."

So say thousands of Language-Phone users. YOU likewise can learn to converse freely in a foreign tongue through the Language-Phone Method.

French—German—Spanish—Italian

You can very quickly gain a familiarity with ordinary, necessary conversation. You can learn also to read and write the language correctly and grammatically. All in just 30 minutes a day by the

Language-Phone Method Combined with Rosenthal's Common Sense Linguistry.

Study with the Language-Phone is a recreation, **not** a task. The phone is ready to instruct you, day or night—for a few minutes or as long as you like—never tires repeating the words and sentences you need to hear. *Read Prof. Rosenthal's explanation, in booklet mailed free on request.*

THE LANGUAGE-PHONE METHOD, 880 Metropolis Building, New York

Rensselaer Polytechnic Institute

Established 1824
Troy, N. Y.

Engineering and Science

Courses in Civil Engineering (C. E.), Mechanical Engineering (M. E.), Electrical Engineering (E. E.), and General Science (B. S.). Also Special Courses.

Unsurpassed new Chemical, Physical, Electrical, Mechanical and Materials Testing Laboratories.

For catalogue and illustrated pamphlets showing work of graduates and students and views of buildings and campus, apply to

JOHN F. NUGENT, Registrar.

Old Hampshire Bond

[10]

WHEN you write to a friend as a friend—when you are *not* trying to sell him something—good taste demands that you eschew the business letterhead.

The question "what other stationery to use" is answered by Old Hampshire Bond Stationery.

"The Stationery of a Gentleman"

is a notepaper, with envelopes to match, for private, personal correspondence. It is as different from business stationery as a dinner coat is from a lounge suit.

Sample packet mailed free. Will you ask for it?

[11]

THE appearance of stationery often tells a very complete story of a firm's ideals and policies.

Think of the men to whom your yesterday's letters were sent.

Aren't they without exception men whom you would like to impress with your good taste and business judgment?

Old Hampshire Bond stands for quality, reliability and service. "Made a little better than seems necessary," it conveys the impression that you are unusually attentive to the requirements of present-day business conditions.

[12]

YOU should see the Old Hampshire Bond Book of Specimens. It shows a wide selection of letterheads and business forms. One style of printing, lithographing or engraving, on white or one of the fourteen colors of Old Hampshire Bond, is sure to express exactly the feeling-tone you desire for your stationery.

Write for it under your present letterhead.

Hampshire Paper Company

South Hadley Falls
Massachusetts

The only paper makers in the world making bond paper exclusively. Makers of Old Hampshire Bond, "The Stationery of a Gentleman," and also Old Hampshire Bond Typewriter Paper and Manuscript Covers.

Travel Books of Timely Interest

Eighteen Capitals of China

By WILLIAM EDGAR GEIL, M.A., LL.D., F.R.G.S.

Author of "The Great Wall of China," etc.

With an Introduction by

W. A. P. MARTIN, D.D., LL.D.

Ex-President of the Chinese Imperial University.

This is undoubtedly the most important work of travel published since Shackleton's "The Heart of the Antarctic."

Dr. Geil, the author of this pre-eminent work, is of the stamp of such men as Livingstone and Stanley. He has penetrated the heart of Africa and made important discoveries in Guinea and New Guinea. In the last six years he has been exploring China, and in two years of this time traveled from end to end of the great Chinese wall. Recently he undertook a greater task than this when he visited each of the several capitals of the eighteen provinces, mapping out their sites and collecting a mass of literature destined to form the basis of a Chinese library.

With 100 illustrations and about 12 maps.
Large 8vo. Over 400 pages. Cloth, gilt top, $5.00 net; postpaid, $5.20.

A Woman's World Tour in a Motor

By HARRIET WHITE FISHER

This is a striking account of a remarkable tour of 23,000 miles in a motor car, made by Mrs. Clark-Fisher. Her experiences in many lands, among strange peoples, and in circumstances of hardships, danger, delight, and humor, make this unusual book fascinating to the motor lover and the traveler. The volume is profusely illustrated with unusual scenes of this notable journey—the first of its kind ever undertaken and completed by a woman.

Profusely illustrated. Handsome cloth binding, 8vo, $2.00 net; postpaid, $2.25.

Edinburgh Revisited

By G. DUVAL

Edinburgh occupies a peculiarly high place in the regard of the civilized world, and to know it is to know one of the most interesting of cities.

Illustrated by Hanslip Fletcher.
Cloth, 8vo, $5.00 net.

Behind Turkish Lattices

By HESTER DONALDSON JENKINS

The author lived for nine years in Constantinople, and she has given us here an intimate account of a Turkish woman's life.

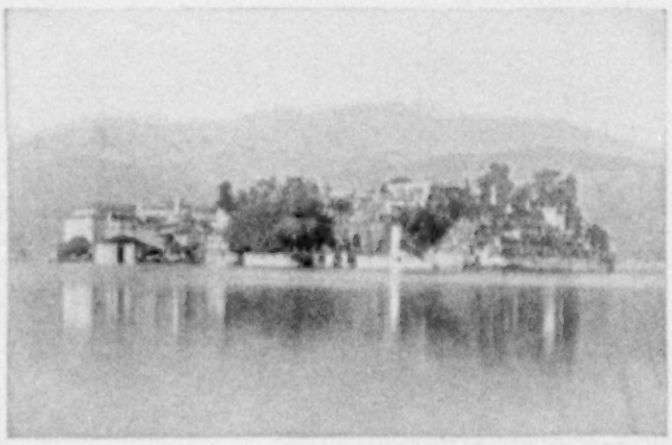
24 illustrations. Cloth, 12mo, gilt top, $1.50 net.

In Château Land

By ANNE HOLLINGSWORTH WHARTON

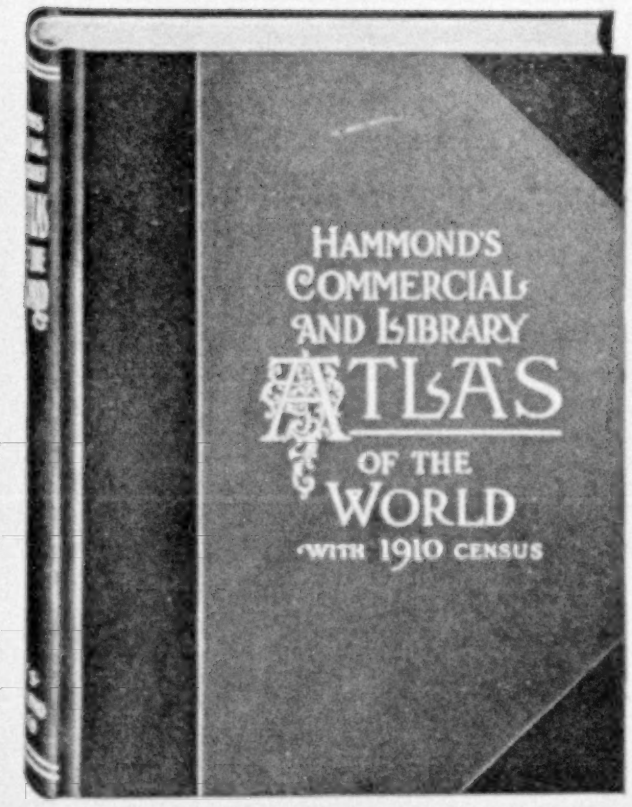
Again, as in her "Italian Days and Ways" and in "An English Honeymoon," Miss Wharton takes a merry party of friends upon a pleasure trip. This time the travelers journey through the storied châteaux of Touraine, stopping en route at some of the picturesque villas on the Italian lakes.

Twenty-five illustrations in duo-tone. Large 12mo. Decorated cloth, gilt top, $2.00 net; postpaid, $2.15.



J. B. LIPPINCOTT COMPANY, *Publishers,* PHILADELPHIA

"Mention the Geographic—It identifies you."



AT LAST!

¶ **Of all magazine readers,** the subscribers to the NATIONAL GEOGRAPHIC have most keenly felt the need of a *new* general atlas; they have needed it not only "in their business," but in their intellectual pursuits; for they are the *true* cosmopolites—the real citizens of the world.

¶ **They wake from sleep** in "The States," but they break their fast in South America; they have luncheon in the Soudan; they dine in Siam, and sleep again in Sicily, Siberia, Sweden, or the Shetland Isles, for the pages of the NATIONAL GEOGRAPHIC are like so many pictured wings that take them on arm-chair journeyings to everywhere.

¶ **But besides** *descriptions* and *pictures* they want *maps* and *statistics;* they are the kind of people that *want* to *know;* hence the need of a new general atlas.

¶ **As this issue goes to press,** there is just one *new* atlas of the world available; just *one* within easy reach and good enough for the most exacting; just *one* with new down-to-date maps and with the complete official results of the U. S. Census for 1910, and with the latest population figures the world over.

HAMMOND'S Commercial and Library ATLAS of the WORLD

¶ **The public has been waiting** for a new general atlas, and now that the work is ready we want the public nation-wide to know it generally. And so we have decided to make a quick, general distribution, even at a price-sacrifice. It is our purpose to break all records by distributing more copies of the new atlas this month than were ever sold by any one in any single month.

¶ **We are going to do this** by dealing direct with the public and by *guaranteeing immediate delivery* on receipt of order, and we offer these inducements:

40 per cent discount

from the regular price
if you order *now*

Your money back if not fully satisfied after three days for examination

¶ **In order that you** may have full information on which to act promptly, we have prepared a Prospectus of the new atlas, showing a double-page map (one of the 175) and explaining the distinct features which make the atlas INCOMPARABLE for the HOME, OFFICE, or STUDY.

¶ **Let us send you** the Prospectus *by mail* (to save time) and you can then order by mail (also to save time) and—the 40 per cent discount.

The price of a stamp brings the Prospectus; requesting it involves no obligation to purchase and no agent will be sent.

CUT OFF AND MAIL TODAY

N.G.M. Nov.

C. S. Hammond & Co. New York:

Please mail me free Prospectus of **Hammond's Commercial** and **Library Atlas** of the **World,** with Specimen double-page Map and full details of price and terms for the two styles of binding.

Name .....

Address .....

USE THE COUPON

C. S. HAMMOND & CO.

142 Fulton Street NEW YORK

"Geographic readers may depend upon the integrity of our advertisers."

THE
MATTHEWS-NORTHRUP WORKS

ENGRAVERS AND PRINTERS

NEW YORK BUFFALO CLEVELAND

WRITING
DESIGNING
PHOTOGRAPHING
PHOTO ENGRAVING
MAPS

COLOR WORK
ELECTROTYPING
PRINTING
BINDING
WAX ENGRAVING

Color Work

THE color section in this number shows the way we engrave and print color work. The plates were made from enlargements of small hand-colored photos, and it was desired to retain the photographic quality. The color section in the November, 1910, number, and the long views of "The Hour of Prayer" and "Panorama of Burgess Pass" were also supplied by us. Our reproductions of scientific specimens are accurate.

Maps

WORK DONE will give you the right idea of the way we make maps. The North Pole map that appeared in this magazine sometime ago, all the maps in the Century Atlas, a large part of those in the new Encyclopædia Britannica, and those in Appleton's Catholic Encyclopædia, all of which are probably as satisfactory as any ever made, are examples of our regular run of map work. Our wall maps are noted for legibility.

Catalogues

IF you want to have your trade catalogue made in the very best style of modern practice with particular reference to graphic planning of illustrations, meeting the exact wants of your sales department, and making it recognized as a leader in its line, let us plan a tentative layout for you. No matter what your product is we can make you a striking and interesting catalogue. We have improved many mechanical catalogues lately.

General Work

THE line of printing of a miscellaneous nature that we do is very comprehensive. Finely illustrated booklets, folders embodying special advertising ideas that we supply, the better class of railroad, steamship, trolley, and city promotion books and illustrated folders, bird's-eyes, calendars, daily reminders, hangers, posters, post-cards, sumptuous souvenir books, in fact, all kinds of letterpress printing and all styles of binding.

SEND FOR SAMPLES AND ESTIMATES

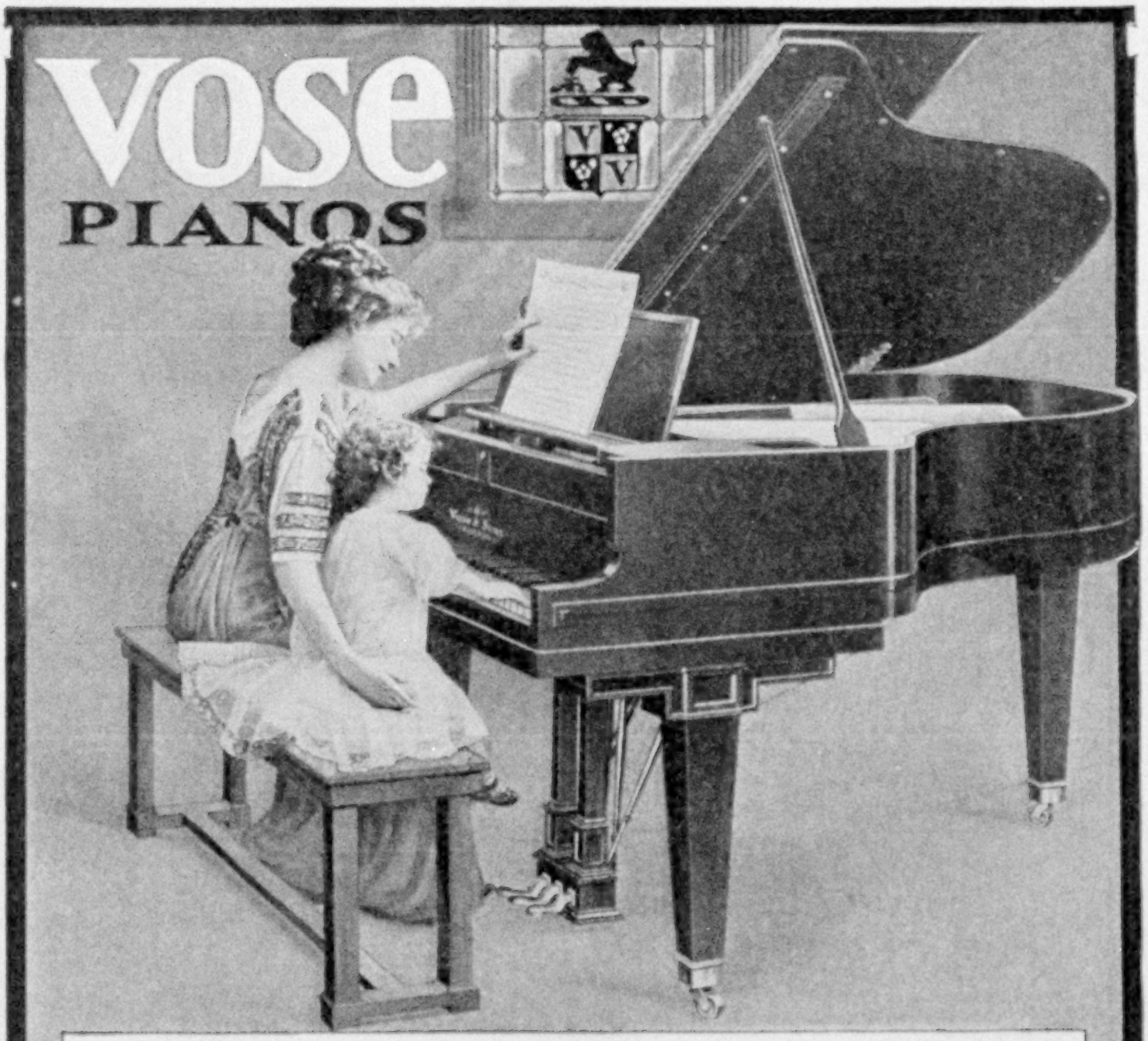
THE MATTHEWS-NORTHRUP WORKS

"THE COMPLETE PRESS"

CLEVELAND OFFICE
CITIZENS BUILDING

HOME OFFICE AND WORKS
WASHINGTON AND EXCHANGE STREETS
BUFFALO, N. Y.

NEW YORK OFFICE
SINGER BUILDING TOWER



This **vose** style of **Home Grand** is a splendid grand piano, suited for any home and sold at a reasonable price. The **tone, touch,** and **magnificent wearing qualities** of the

VOSE PIANOS

are only explained by the exclusive patented features, the **high grade** material, and superb workmanship that enter into their construction.

We deliver, when requested, direct from our factory free of charge and guarantee perfect satisfaction.

Liberal allowance for old pianos. Time payments accepted.

FREE—If you are interested in pianos, let us send you our beautifully illustrated catalog, that gives full information.

VOSE & SONS PIANO CO.

157 BOYLSTON ST. BOSTON, MASS.

PRESS OF JUDD & DETWEILER, INC., WASHINGTON, D. C.